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ABSTRACT

To identify the needs of the employee for job entry in the automotive trades, data were collected by questionnaire from graduates of vocational and technical schools in the State and from their employers. The information obtained was intended to be utilized by educators in upgrading vocational school automotive programs and curriculums. Findings indicate that, in general, employers were satisfied with the training the graduates received. The graduates also rated their training good, but called for more hours of training in general and specialty areas and courses more relevant to auto mechanics. The study reveals that the greatest problems involve the weak placement programs of vocational schools and the substandard wages reported by many of the graduates. Recommendations relate to such items as: (1) better communications between industry and automotive training programs, (2) licensing programs and other programs to help raise wage rates for graduates, (3) emphasis on making related subjects relevant to automotive subjects, and (4) review of the number of hours of actual automotive training. (KH)

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FINAL REPORT

Project No. 04.040.151.222

AN EVALUATIVE STUDY OF AUTO MECHANICS AND AUTOMOTIVE TECHNOLOGY PROGRAMS AND CURRICULA

November, 1972

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Final Report

Project No. 04.040.151.222

AN EVALUATIVE STUDY OF AUTO MECHANICS AND AUTOMOTIVE TECHNOLOGY PROGRAMS AND CURRICULA

Melvin Seamans
Madison Area Technical College
Report Writer

Joseph Rinck
University of Wisconsin - Stout
Investigator

Merlin Maiers
Madison Area Technical College
Project Supervisor

Madison Area Technical College
211 North Carroll Street
Madison, Wisconsin 53703

Norman P. Mitby, Director

November, 1972

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FOREWORD

This study was undertaken with the hope that the information gained could be applied throughout the State of Wisconsin to help the various Vocational and Technical schools upgrade their automotive programs. The need to keep our programs in step with the changing technology in the automotive field is being felt by everyone concerned with the training of personnel entering the trade. Air pollution, safety and a general trend of trying to upgrade the quality of the automotive tradesman are just a few of the reasons for people involved in automotive training programs to attempt to increase the quality of their curriculums.

In general it is healthy to look at what we are doing for our graduates and the people that employ them. This survey attempts to get the feelings of these groups and tries to draw some conclusions from the opinions these groups have of our present curriculums and what they feel should be added to our programs.

Because the automotive training programs of our State are bursting at their seams in terms of numbers of students in recent years, it is also the attempt of this survey to see if we are not saturating the market with to many graduates. It was felt that this could best be determined by the number of graduates, that in the final analysis end up working somewhere in the automotive trade.

The actual jobs performed by the graduates and what the employer feels in needed by a person coming to him for his first job, was also considered to be of prime importance in determining what the content of our programs and courses should be. The need to look at what the graduate needs in terms of related courses and the content of these courses was one area that was given special consideration. Often students taking an automotive program express the opinion that many of the related courses are not a necessary part of their program. The survey has attempted to answer that question and the information provided should be given special attention by anyone responsible for orientation of automotive students entering our programs and by people with counciling duties.

There is one thing that will become apparent as one takes a look at the variety of jobs listed by graduates. Many of our graduates do not end up working in the automotive trade. The reasons are many, but one reason becomes apparent when wages of those working in other than automotive areas are compared with those of the auto mechanic. The licensing of mechanics and of automotive service outlets was not covered by this survey, but it is a subject that we as leaders in the automotive service trades need to become involved in. The good and bad of licensing has long been discussed. One thing that it could do is to raise the stature of the trade and possibly raise the wages of some of our graduates.

The need for more sophistication in the repair and servicing of the automobile is being investigated by the auto manufacturers, the Federal and State governments and by private agencies. The educational institutions of this State must keep their curriculums geared to meet the needs of this changing technology. It is hoped that this survey report will be of help in meeting this need.

ACKNOWLEDGEMENTS

The following people or groups have helped to make this study possible.

Mr. Merlin Maiers, Assitant Chairman Trades and Industry, Madison Area Technical College, whose help and guidance has been much appreciated.

Mr. Arnold Potthast and Mr. Roland Krogstad, Wisconsin State Board of Vocational, Technical and Adult Education, for their advice and help.

Gratitude is also expressed to the graduates and employers who were willing to give of their time to make the survey a success.

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Chapter I
INTRODUCTION

I. Problem and Need:

A. Startling developments in science and technology and a rapidly expanding economy are spelling out important changes in the structure of the occupational world. Specific jobs become obsolescent more frequently, old occupations disappear, and new occupations emerge, not always in foreseeable fashion. The pressures of a rapidly changing technological society make career decision making by youth, curriculum revisions by staff, and program planning by administrators even more dependent on research, follow-up of students, and assessment by employers for appropriate data and information needed in developing plans, solving problems, improving instruction, and assessing progress toward achieving the goals of the system.

B. The success of an institution can best be measured by the success of the student. To ascertain the effectiveness of a school's programs, there must be a follow-up from the day the student enters the institution until after he gains employment or transfers to another institution. Follow-up is a process by which an educational institution seeks to determine how effectively it is meeting the current and future needs of those it serves. Vocational, technical and adult education State staff and districts must determine how well their stated mission, goals and objectives are being achieved. The employer of the product is also a valuable source of information.

C. Follow-up studies indicate that many graduates of occupational education programs are not placed in the occupation for which they were prepared. Others move from one occupation to another. Many are asked to leave the establishment. Many need further training on the job.

D. A challenge to educators is to find a curriculum that will equip these individuals to do the job required of them, but the two-year school must beware of producing functional illiterates. Clyde E. Blocker warns us with this statement:

> The two-year college has been caught in the middle of this drive to increase the education of the population. The four-year college and the university are ill equipped to cope with the increasing hordes of education minded individuals, particularly when so many lack even the most rudementary requirements for baccalaureate courses. The comprehensive tw-year college, with its willingness to offer courses of less than collegiate level, has been cited as the salvation of low ability students. It must be pointed out, however, that if theses courses do nothing more than promote a higher level of functional illiteracy then the tw-year college is not fulfilling its functions.

E. It is then the job of educators to design a curriculum that will produce a specialized worker, who will be able to go out into the world of work and to do the job for which he or she has been trained. Juanita G. Gillen makes this observation:

> As automation and an increasingly technical society have created new jobs that make education beyond the high school a necessity, many universities have met this and other adult education needs through branch off-campus centers. Community junior colleges are better equipped to give technical and semiprofessional programs than four-year colleges; in this respect they are not competitive, but complementary to four-year higher education programs. Community colleges' programs appeal to an ever wider range of needs of both youth and adults in increased numbers. These colleges are taking a new look at their aims and objectives and the curricula offered to meet these goals.

The Problem in Developing Curriculum

F. The development of curricula to meet the needs of the people can be approached in a number of ways. An interesting challenge from Edward J. Morrison:

> It is a significant forward step to decide as you have that a curriculum will be based upon analysis of the performance capabilities desired of graduates. I would agree that this is the proper basis for all curriculum development, but many who are less convinced than I of the validity of the general proposition would agree with you that specification of terminal performance capabilities is essential to development of revelant effective, efficient vocational curricula. For some time now, the American Institute for Research has been engaged with public school people in several projects to develop curricula which are relevant to three kinds of student needs: Vocational competence, responsible citizenship, and a continuing self-fulliment.

G. One of the problems confronting educators in developing curricula is the problem of time and change. Our inowledge is spiraling with each days passing. Each innovation calls for new skills and knowledges. How can the curriculum then keep pace with the times? The anseer may lie in bringing industry to help in building the curriculum with the help of advisory committees, workers and employers. They could help in the following ways:

1. Helping to determine the scope, breath and extent of specialization of the cirriculum and specific courses.

2. Assisting the analysis of special job skills and related technical knowledges required for employment.

3. Identifying types of occupations for which training may be needed.

4. Recommending needed changes in curriculum or specific courses of action.

5. Arranging for faculty and advanced students to attend local conventions, seminars and programs.

6. Conducting educational seminars, field trips and conferences designed for career orientation and enabling students to meet business leaders.

7. Donating or lending needed instructional equipment and supplies to keep training up to date.

8. Assisting faculty chairman or coordinators to maintain liaison with a wide range of business industrial contacts.

9. Providing summer employment to encourage the staff to keep current in the field of specialization.

10. Providing students part-time internship experiences, summer employment and work study programs.

H. Curriculum Based on Employer's Needs:

The basis for constructing and maintaining a relevant curriculum can be obtained from employer's needs. In addition to using advisory committees and joint curriculum committees, surveys of employer's observation of workers on the job, interviews with supervisors and other methods can be used.

I. A Diploma program and an Associate Degree program are a part of the programs offered by many of the schools in the Wisconsin VTAE system These programs will be the object of this evaluative study.

Because of the needs cited it seems logical that the following objectives be established for this project.

The Objectives of the Study

The main purpose of this study was to identify the areas of our automotive mechanics programs that:

1. Presently are meeting the needs of employers and the graduates from these programs.

2. Are in need of change or revision to meet the requirements of employment int the automotive jobs that are offered to our graduates.

3. Should be dropped or added to our curriculums to make the sensitive to the needs of our graduates and their employers.

The study was also designed to identify present and future employment needs in the various areas of our State. It is this information that can be helpful to people in designing the size and scope of our automotive programs.

The objective is to identify the needs of the employee for job entry and the traits and skills necessary to keep the job and advance as the opportunities arise.

Chapter II
METHODOLOGY

Selection of Participants

A list of employers and the graduates they had employed were supplied by the districts through a request by the Wisconsin State Board of Vocational and Adult Education. Not all districts were involved in automotive programs for the survey period of 1967 through 1971. Most of the lists supplied by the districts were fairly complete for the graduates and their addresses, but most of the lists were very incomplete concerning employer information and addresses.

The usable employer addresses were assembled and surveys were sent. Fifty of the employers were asked to participate in personal interviews. The cooperation of the employers was good concerning the personal interviews, but poor response was experienced on the returns of the surveys by mail.

Design of the Questionaire

Selection of the questions and information contained in the questionaires was based on the cirriculums and the specific courses listed by the catalogs automotive listings and their related courses. Automotive texts and instructors teaching some of these courses were asked to help design the questionaires. Employers were contacted in regard to the employer survey. The kinds of information asked for was intended to provide information that could help establish the worth of our cirriculums to the employers and the graduates of our programs. A comprehensive review of the programs and their content and the needs of employers and graduates were the main considerations in the design of the questionaires.

Before actual collection of the data the questionaires were tried on several test groups. Second year automotive students that had automotive jobs were used on the employee surveys. The employer survey was review by consultants hired for this purpose.

Processing Procedures

The information gathered by the instruments and the investigators was processed and the report was written. It was decided to divide into the three general areas covered by the surveys. The information is reported by the number of respondents answering and by the percent of the respondents they represent. In some cases the information provided by the employer and the graduate is compared.

Comments and Remarks

There are many comments and remarks contained on various pages of this report. Many respondents took the opportunity to express their opionions. Many of these remarks were repeat and for that reason not all remarks received are reported. It is to the credit of the people working in the various automotive programs in the State of Wisconsin that the comments concerning the quality of our programs is usually highly favorable. Although the statistics provided by this report help tell the story of the needs and desires of the employers and graduates, the remarks and comments provide the depth of understanding that should help us determine the merits of some of the areas of our curriculums.

CHAPTER III

FINDINGS

INTRODUCTION TO THE FINDINGS

In the areas of subject matter evaluation the graduates were asked to rate the value of various subjects as the subjects related to their jobs. The students were also asked to comment at the end of each subject area and many supplied comments. Selected comments for each subject area follow the subject matter evaluation for each of the areas studied.

Many times a student in an automotive program expresses his wish that he should not take any related subjects such as mathematics, science and communications. We asked the graduates how they feel about the degree of need for these subjects. The results are summarized immediately following the statistics for each area. The results in some cases tend to reinforce the structure of present programs. In other cases the need for the subject matter is shown, but the degree or depth needed for the jobs tend to vary.

The study tries to establish the amount of use a graduate has on his job for the different subjects. The data for those questions is sometimes a more reliable key to the need fôr these subjects than are the individual questions concerning the subjects. It is interesting that some graduates checking knowledge Essential will in turn indicate they have little use for a given subject area on their job. One can only assume that people have use for these subjects at home or in some avocational area. Some may consider the knowledge essential for daily living. The reasons people feel a subject is valuable are many. It should be noted that most graduates seem to feel academic subjects are more valuable as they progress in their jobs and their lives.

The graduates were asked, "how do you like your present job". There was a choice of four answers. The range of answers were fairly wide in distribution. Many graduates stated that they like their job, but plan to move on. The reason for their desire to move became somewhat apparent during the personal interviews and by analyzing the data on salaries paid graduates. A picture of low pay for this industry tends to emerge. Many starting salaries fall much below the salaries in other jobs requiring much less training.

One example of dissatisfaction with wage conditions was expressed by a graduate that cornered the interviewer on one of the personal visits. This graduate had been working in highly skilled areas of the automotive trade for two years since graduation, but was only being paid $2.25 per hour. This graduate intends to quit the mechanics trade and go to work for a manufacturer who pays twice his present salary for a starting wage. It is very unfortunate that we the people of Wisconsin are spending the money to provide the auto industry with qualified people, only to have them treated so badly on the pay scales.

In defense of some of the shops that are paying good wages, it is not the fault of all business that the industry has a bad name for what the industry pays its mechanics.

The following degrees of job satisfaction were expressed by the graduates.

EMPLOYERS SECTION

EMPLOYERS SURVEY DATA

Of 931 employers identified from the district reports, only 477 of these employers were identified by an adequate address. The remaining 454 were either identified by name only or they were employers entirely out of the automotive field. It could not be expected that an employer not directely connected to the automotive field should be able to fill out a survey. 29 of these surveys were returned for insufficient address or bussinesses no longer at that address.

It is the recommendation of this report, that all districts attempt to keep better records of their graduates. Graduates should be asked to fill out data forms when they graduate and also supply the needed information through progressive follow up studies.

Concern was expressed by the employers that this survey was to long in length and that they could not afford the time to fill it out. The returns tend to re-enforce this statement, as only 52 usuable returns were received. The total number returned was 55 or 13% of those mailed. Complete returns shown by district are on the following page.

It is recommended that anyone doing another survey such as this one should attempt to keep the survey instrument to three pages or less in the interest of getting a better percentage of returns.

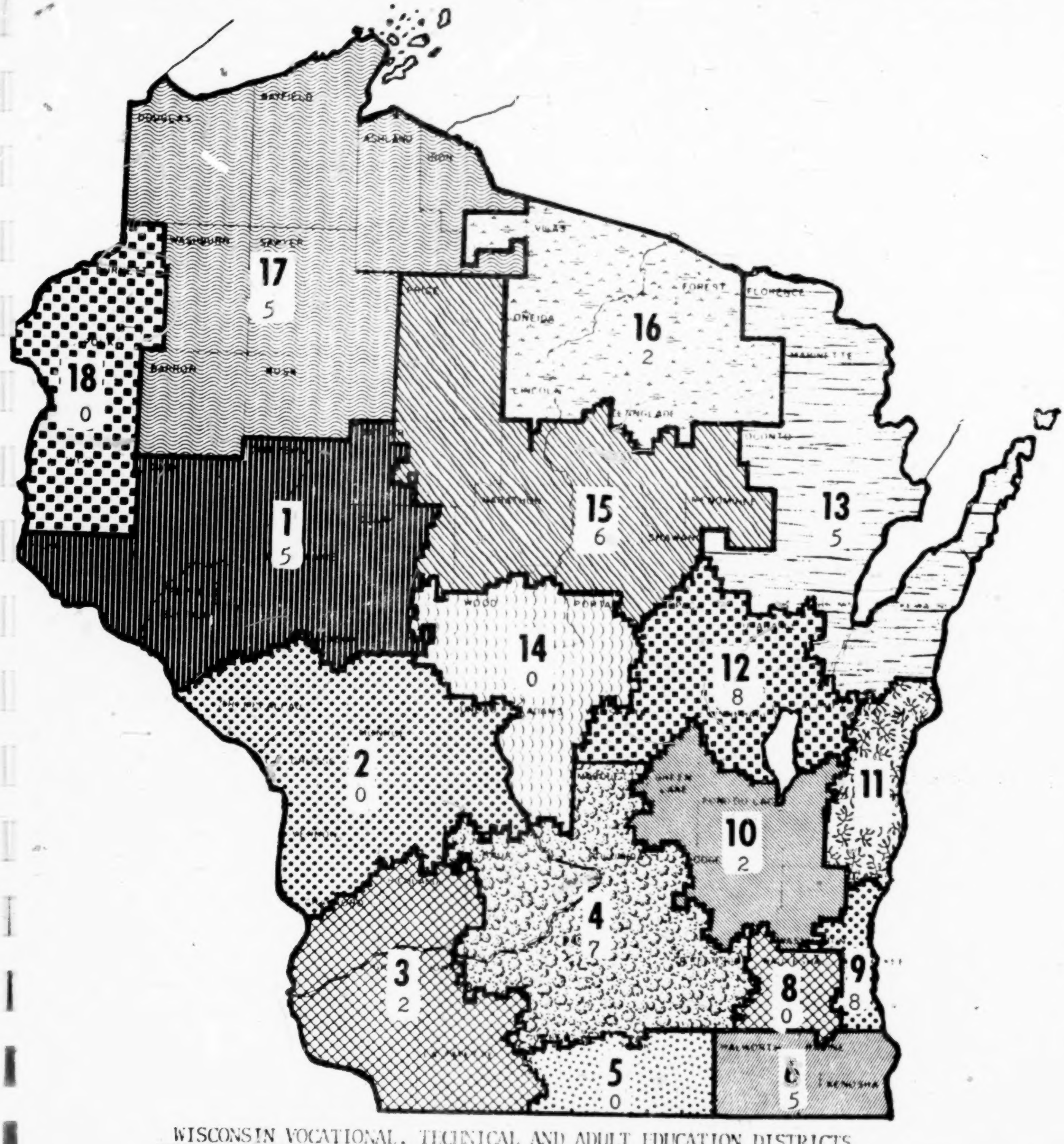
The personal interviews were handled by both investigators. 25 interviews were assigned to each investigator. The State was divided to allow the easiest access to the employers by car and in some cases by light air-craft.

The interviews in general tend to indicate that the employers are quite satisfied with the graduates they are obtaining from our programs. Most employers were very willing to take time from their schedules to be interviewed. Many helpful comments were forthcoming and these are printed in a rather large comments section at the end of the survey.

State of Wisconsin \ BOARD OF VOCATIONAL, TECHNICAL & ADULT EDUCATION

EUGENE I. LEHRMANN
State Director
137 EAST WILSON STREET
MADISON, WISCONSIN 53703

Number of employers responding, located by district.


DOUGLAS
BAYFIELD
ASHLAND
IRON
VILAS
WASHBURN
SAWYER
17
5
FOREST
FLORENCE
ONEIDA
16
2
MARINETTE
18
0
BARRON
RUSK
LINCOLN
LANGLADE
OCONTO
1
5
MARATHON
15
6
SHAWANO
13
5
WOOD
PORTAGE
14
0
12
8
2
0
GREEN LAKE
FOND DU LAC
11
10
2
DODGE
4
7
3
2
8
0
9
8
5
0
WALWORTH
6
5
KENOSHA

WISCONSIN VOCATIONAL, TECHNICAL AND ADULT EDUCATION DISTRICTS

APPROVED FOR OPERATION JULY 1, 1971

EMPLOYER SURVEY

The table below contains the data describing the number of companies contacted by the survey (described by district)

DISTRICT	Number Surveys	Returns		Personal visits		
		Returned	Not Returned	Scheduled	Completed	Not Complete
1	34	5	29	8	8	
2	33	0	33	3	3	
3	9	2	7	3	3	
4	39	7	32			
6	47	5	42	2	2	
9	58	8	50	3	3	
10	23	2	21	4	4	
11	7	0	7	1	1	
12	42	8	34	4	4	
13	45	5	40	3	3	
14	10	0	10	2	2	
15	31	6	25	1	1	
16	25	2	23	3	3	
17	24	5	19	2	2	
Totals	427	55 or 13%	372	50	50	

From the 1967-1971 automotive program graduates, a total of 931 employers were identified. Of that number 477 (51%) were asked to participate in the survey. Personal visits were made to 50 of the employers.

EMPLOYER DATA

Persons responding to the employer survey listed the following titles:

> Service department manager, Cheif engineer, Owner, TBA manager, President, manager, Training supervisor, Superintendent, Business manager, Dealer personel coordinator and General manager.

The number of automechanics employed by the 52 employers was 1142. This is an average of 22 mechanics per employer. This average is not a good statistic to base anything on because one employer was a large city employing 403 mechanics.

Employers reported that 7.5% of their employees work on a part-time basis. Most employers interview reported that they seldom employ on a part-time basis and some say that they would prefer to employ apprentices, rather than part-time people.

Employers report that they employ 28% of their mechanics directly from the vocational schools of our State. The favorite means used by employers to get someone from one of our programs is by directly contacting the schools. The second most often noted means was by contacting employment agencies.

The average starting wages for a beginning graduate was $460.00 per month. The high was $787.00 while the low was $225.00. As stated earlier in this report, the wages paid to many of the graduates is to low to keep them interested in the automotive trade. The employers and our schools are both at fault for this situation. The employers should be more realistic in the amounts they are paying, while the schools are to quick to place a graduate without checking out the working conditions and wages. This is a real sore point with the graduates and employers alike. The graduate wants more money for his services, while the employer feels that until a graduate can prove his abilities he will have to work for a low wage.

MATHEMATICS

The employers were asked to rate the value of the various mathematics areas in respect to what they would expect from a graduate from one of the vocational auto mechanics programs of our schools.

Mathematics	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Basic math	35	67	16	31	1	2
Formulas	5	11	32	68	10	21
Fractions and decimals	23	44	26	50	3	6
Systems of measuring angles	13	27	27	55	9	18
Horsepower calculations	8	15	27	52	17	33
Shop geometry and layout	7	14	20	59	13	27
Graphs and charts auto related	20	38	27	51	6	11
Business math	12	24	29	58	9	18
Calculate areas and volumes	7	14	19	40	22	46
Payroll calculations	3	6	18	37	28	57
Repair order breakdowns	20	40	22	44	8	16
Parts make-up	20	38	27	52	5	10
Bookkeeping and accounting	2	4	23	46	25	50
Algebra	1	2	17	34	32	64
Powers & roots	4	9	11	23	32	68
Job estimates	21	39	25	46	8	15
Inventory control	8	15	28	54	16	31
Ordering parts and supplies	13	26	23	45	15	29
Income tax	4	8	19	40	25	52
Percentages	3	7	31	69	11	24
Ratios	12	26	21	46	13	28
Bills and billing	5	10	20	56	17	34
Wages and wage plans	4	8	30	63	14	29

MATHEMATICS

This chart represents the amount of mathematics employers feel an auto mechanic in their employ needs to do his job. The last two columns are the results of the same question asked of the employees. Although this same information appears in the employee section of this report, this display gives the reader a chance to compare the results of both surveys.

Use Rating	Employer		Employee	
	#	%	#	%
Heavy use (daily)	20	38	108	40
Medium use (weekly)	21	40	109	41
Light use (monthly)	11	21	44	16.5
Never used	1	1	7	2.5
Totals	53	100%	268	100%

This chart indicates that both employers and employees agree on the amount of mathematics needed to be a good mechanic. It also points out that medium to heavy use of mathematics is indicated by about 80% of the respondents. The need for a good mathematics course or courses in our automotive curriculms is re-enforced by this information.

MECHANICAL DRAWING

The employers were asked to rate the amount of knowledge they felt an automotive mechanic needs in the areas of mechanical drawing.

Mechanical drawing	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Blueprint reading	15	30	23	46	12	24
Shop sketches	17	36	20	43	10	21
Drafting instruments	3	7	15	35	25	58
Use of automotive symbols	25	51	16	33	8	16

The respondents were asked to rate the amount of use their employees would have for mechanical drawing.

Use rating	Number	Percent
Heavy use (daily)	4	8
Medium use (weekly)	14	27
Light use (monthly)	22	43
Never used	11	22
Totals	51	100%

The indication is that not very many employers place a high value on these subjects.

SCIENCE

The employers were asked to rate the amount of knowledge they feel an automotive mechanic needs in the science areas.

Science	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
General Areas	#	%	#	%	#	%
Basic Chemistry	2	4	18	40	24	56
Basic Physics	7	16	19	42	19	42
Basic Science	9	19	28	49	15	32
Specific Areas	#	%	#	%	#	%
Properties of liquids	7	15	24	52	14	33
Change of state	6	13	25	56	14	31
Heat	12	27	23	51	10	22
Light	7	16	22	50	15	34
Sound	12	28	18	42	13	30
Magnetism	15	35	16	37	12	28
AC and DC electricity	25	51	21	43	3	6
Refrigeration	16	32	26	52	8	16
Work and energy formulas	5	11	22	49	18	40
Electronic theory	7	15	23	50	16	35
Basic fluids and laws	10	23	20	45	14	32
Gases, paints, lacquers, etc.	7	16	28	62	10	22
Plastic, glass, fabrics, etc.	2	4	29	66	13	30
Salts, acids, and bases	3	6	26	58	16	36
Batteries	30	63	16	33	2	4
Symbols and equations	6	13	30	64	11	23
Basic electricity	27	58	17	36	3	6

This information represents the use ratings assigned to the areas of science by the employers and employees The employers and graduates were asked: In general, how would you rate the need for science for the automotive mechanic?

Use Rating	Employer		Employee	
	#	%	#	%
Need more science	16	35	114	44.5
Present knowledge is sufficient	24	52	124	48.5
Little to No science is needed	6	13	18	7
Totals	46	100%	256	100%

The area of science is an area of disagreement. Nearly all persons concerned with training or employing persons graduating from the automotive training programs of our State agree that many science subjects are a necessary part of an automotive training program. The disagreement comes from trying to define the necessary areas and subjects. Although most respondents tend to say that present courses are adequate, they also tend to indicate that only very little knowledge is essential in most of the specific subject areas. It appears that some effort should be made to separate out the areas of major importance and concentrate on them.

GENERAL EDUCATION

The employers were asked to rate the value of general education courses as they relate to the automotive mechanic doing his job.

General Education	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
General English	24	49	22	25	3	6
Speech	17	35	25	52	6	13
Report writing	17	35	20	42	11	23
Ecomomics	10	21	26	54	12	25
Reading & understanding data	30	61	18	37	1	2

The following data is the value rating that the graduates and employers placed on general education courses.

Value Rating	Employer		Employee	
	#	%	#	%
Of great value	29	58	114	44.5
Of some value	20	40	124	48.5
Of little value	1	2	16	6
No value	0	0	2	1
Totals	50	100%	256	100%

There is a very high value placed on most of the general education courses.

SALES AND MANAGEMENT

This information is the employers ratings for the area of sales and management.

Sales and Management	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Sales methods	18	41	18	41	8	18
Business Management	5	11	28	64	11	25
Marketing	5	11	22	50	17	39
Insurance	3	7	19	43	22	50
Finance	6	14	19	43	19	43
Retail selling	20	44	11	25	14	31
Customer Relations	31	69	10	22	4	9
Public relations	28	62	12	27	5	11
Shop management	17	35	28	58	3	7
Government Regulations	16	35	23	50	7	15
Interview Techniques	6	14	22	50	16	36
Wholesale selling	9	20	14	31	22	49
Service writing	13	28	27	59	6	13
Service Management	16	35	25	54	5	11
Public relations	25	54	17	37	4	9
Operate the Business	14	32	21	48	9	20
Service sales	24	52	16	35	6	13
Factory service	15	35	17	40	11	25

SALES AND MANAGEMENT (cont)

The employers were asked: In general, would you like to see more of these type of courses taught or would you rather see them taught less?

33 employers or 85% indicated they would like to see more of these type of courses taught.

6 employers or 15% indicated they would prefer the courses to be taught less.

The graduates were also asked the same question concerning the sales and management courses.

179 graduates or 76% indicated that they would like these courses increased.

56 graduates or 24% of those responding said that they would prefer to have these courses taught less.

The respondents were not given the choice of indicating that the present amount of courses in this area are adequate. The above information would become more valuable had they been given this choice.

METALS AND PLASTICS

The employers were asked to rate the amount of knowledge a beginning automotive mechanic should have in the areas of metals and plastics.

Metals and Plastics	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Machine shop	22	47	22	47	3	6
Gas welding	34	60	18	36	2	4
Arc welding	30	60	18	36	2	4
Welding aluminum	10	20	29	60	10	20
Brazing	30	67	13	29	2	4
Cutting metal with gas	31	65	14	29	3	6
Forging	6	12	20	42	22	46
Plastic molding processes	3	6	10	21	34	73
Die-casting	2	4	11	23	34	73
Heat treatment	9	19	13	28	25	53
Properties of Metals	15	32	24	51	8	17

The employers were asked to assign a use rating for the subject areas of metals and plastics
The graduates responses for the same question are included for comparision purposes.

Usage rating	Employer		Employee	
	#	%	#	%
Daily	23	45	126	47
Weekly	19	37	85	31
Monthly	7	14	44	16
Never	2	4	16	6
Totals	51	100%	235	100%

RELATED AUTO SUBJECTS

These related auto subjects are sometimes part of the regular automotive cirriculums, but are often separated out and taught in special classes. The employers were asked to consider the importance of these subjects to their beginning employees.

Related auto Subjects	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
How to obtain Tech info & specs	31	63	15	31	3	6
Use of trade Manuals	35	70	14	28	1	2
Union & labor Organizations	2	4	25	51	22	45
Apprenticeship and journeymen	6	13	23	54	14	33
Retirement and Insurance	4	9	32	71	9	20
Dealership Organization	3	6	28	61	15	33
Further schooling for advancement	22	46	20	42	6	12
Parts department Procedures	10	21	29	62	8	17
Used and new Car preparation	10	22	19	41	17	37
Auto production Techniques	7	15	24	52	15	33
Sell merchandise	19	40	20	42	8	18
Auto body repair	9	18	24	49	16	33
Accessories	16	33	26	54	6	13
Air-conditioning	20	41	22	45	7	14
Light body repair	8	17	27	56	13	27

The employers were asked what importance they attached to the above subjects for the graduates they would employ.

25 or 49% indicate these subjects to be of major importance. 26 or 51% indicated them to be of minor importance. No one said they were of no importance.

AUTOMOTIVE SUBJECTS

Employer responses

Brakes	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Theory of brakes and friction	36	86	4	9	2	5
Brake construction	41	82	7	14	2	4
Self energization	36	75	10	21	2	4
Hand brakes	28	65	13	30	2	5
Power brakes	33	70	12	26	2	4
Adjustment of Brakes	40	84	5	10	3	6
Flushing and Bleeding	40	87	4	9	2	4
Brake relining	40	85	5	11	2	4
Drum and shoe grinding & fitting	40	85	3	6	4	9
Cylinder overhaul and repair	39	85	5	11	2	4
Disc brakes	33	78	5	12	4	10

Chassis and Ride Control Theory	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Chassis and Ride control theory	27	63	11	26	5	11
Springs	29	65	13	29	3	6
Shock absorbers	33	70	10	21	4	9
Wheel alignment Theory	32	70	11	24	3	6
Wheel alignment visual inspection	33	72	10	22	3	6
Wheel alignment Road test	32	68	11	23	4	9

AUTOMOTIVE SUBJECTS (cont)

Employer responses

Chassis and Ride Control	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Wheel alignment Service	32	68	12	26	3	6
Lubrication	37	79	8	17	2	4
Fluid system	37	79	8	17	2	4
Lubrication Inspection serv.	34	74	10	22	2	4
Rear independent suspension system	31	67	11	24	4	9
Wheel balancing Theory	35	75	9	19	3	6
Balancing wheels (static & dynamic)	32	70	12	26	2	4
Diagnosis of Suspension problems	34	76	7	15	4	9
Tire tread and wear	32	70	10	22	4	8
Plies and tire size	27	61	12	27	5	12
Radial tire design	28	61	13	28	3	6
Tire care	27	59	14	30	5	11
Tire service	25	54	18	39	3	7
Tire construction	28	61	15	33	3	6
Tire rotation	30	65	12	26	4	9
Differentials Theory	29	62	24	30	4	8
Rear axle theory	28	61	15	33	3	6
Description of axle types	28	61	15	33	3	6
Wheels	30	65	13	28	3	7
Drive lines	30	66	13	28	3	6
Leaf springs	31	66	13	28	3	6
Front end Suspension systems	33	73	9	20	3	7

AUTOMOTIVE SUBJECTS (cont)

Employer responses

Engine Principles of Operation	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Engine principles of operation	37	86	6	14	0	0
Component parts	35	81	8	19	0	0
Tolerances of Components	32	76	9	22	1	2
Theory of Internal combustion	32	74	11	26	0	0
Detonation	32	76	10	24	0	0
Preignition	33	77	10	23	0	0
Engine Efficiencies	32	76	10	24	0	0
Trouble shooting engine troubles	40	93	3	7	0	0
Lubrication system Theory	34	76	11	24	0	0

Cooling System Theory	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Cooling system Theory	34	78	9	20	1	2
Heat exchangers	30	68	14	32	0	0
Heat transfer	33	75	11	25	0	0
Troubleshooting	38	88	5	12	0	0
Repair and service	37	86	5	12	1	2

AUTOMOTIVE SUBJECTS (cont)

Employer responses

Automatic Transmission Theory	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Automatic Transmission theory	23	53	18	42	2	5
Basic principles of operation	26	60	14	33	3	7
Torque Specifications	21	49	17	40	5	11
Torque converters	24	56	14	33	5	11
Hydraulic systems	22	51	16	37	5	12
Transmission Gearing	22	53	16	38	4	9
Removal of Major units	25	59	15	36	2	5
Power flow at various shift points	21	49	18	42	4	9
Adjustments	29	67	11	26	3	7
Be familiar with several types	30	71	10	24	2	5
Tune-up Theory, Practice, & Procedure	38	85	6	13	1	2
Theory of Basic Electrictiy	36	86	6	14	0	0
Electrical Systems	35	78	9	20	1	2
Standard ignition	31	71	12	27	1	2
Transistorized Ignition systems	32	75	10	23	1	2
Timing advance Mechanisms	35	81	6	14	2	5
Starters	35	82	7	16	1	2
Alternator charging Systems	37	86	5	12	1	2
Generator charging Systems	35	82	7	16	1	2

AUTOMOTIVE SUBJECTS (cont)

Employer responses

Electrical Systems (cont)	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
In-depth theory in the above systems	33	77	6	14	4	9
Trouble shooting Electrical systems	37	86	5	12	1	2
Servicing the Electrical systems	34	83	6	15	1	2
Fuel Systems	#	%	#	%	#	%
Fuel systems	32	73	11	25	1	2
Theory on fuels and carburetion	33	72	13	28	0	0
Combustion process	32	70	13	28	1	2
Additives	29	65	15	33	1	2
Fuel feed Systems	35	76	11	24	0	0
Component parts	32	71	13	29	0	0
Pressure and Temperatures	31	69	14	31	0	0
Principles of Carburetion	35	78	10	22	0	0
Carburetion Accessories	33	73	12	27	0	0
Types of Carburetors	31	68	14	31	1	2
Fuel injection	26	59	17	39	1	2
Purpose of Supercharging	21	45	23	49	3	6
Effects of altitude	28	58	15	31	5	11
Trouble shooting the fuel system	38	83	6	13	2	4
Servicing the fuel system	37	82	7	16	1	2
Theory of emission control systems	31	69	14	31	0	0
Electrical control of emmission systems	30	67	14	31	1	2
Principles of Emission systems	31	69	12	27	2	4

JOB ACTIVITIES

The employers were asked to rate the degree of proficiency they feel the Vocational school graduate should have in certain areas.

Job activity	Proficiency is Essential		Some Proficiency Advisable		No Proficiency Necessary	
	#	%	#	%	#	%
Align front Axles	12	26	27	59	7	15
Balance wheels	21	48	19	43	4	9
Replace front end components	23	49	21	45	3	6
Diagnose front end problems	20	45	29	45	4	10
Tune engines	39	81	8	17	1	2
Test electrical Units	37	79	9	19	1	2
Repair electrical units	25	54	18	39	3	7
Use equipment to diagnose Ign.	36	74	12	24	1	2
Operate chassis dynomometer	7	17	23	53	13	30
Repair standard Transmissions	16	34	21	45	10	21
Repair automatic Transmissions	24	51	15	32	8	17
Diagnose trans. & driveline problems	16	35	27	59	3	6
Repair rear axle Assemblies	22	47	15	32	10	21
Grind valves	21	47	19	42	5	11
Overhaul or rebuild engines	17	35	21	44	10	21
Light body repairs	5	11	24	55	15	34
Sell Merchandise	10	22	24	53	11	25
Manage a department	7	15	20	44	19	41
Operate the business	6	14	15	33	24	53
Do manufacturing Processes	7	16	11	25	25	59
Repair or replace driveline parts	12	35	19	56	3	9
Brake drum Turning	15	47	9	28	8	25
Carburetor Overhaul	21	51	18	44	2	5

The employers were asked to rate the subject knowledge and skills of employees who come from the vocational school programs

Subject	Strong		Moderate		Weak	
	#	%	#	%	#	%
Brakes	15	38	24	62	0	0
Chassis and Ride Control Theory	3	8	24	65	10	27
Engine Principles of Operation	17	44	22	56	0	0
Cooling Systems	11	28	26	67	2	5
Automatic Trans.	4	10	18	49	15	41
Theory of Basic Electricity	12	31	18	46	9	23
Electrical Systems	9	23	24	60	7	17
Tune-up Theory, and Procedures	16	41	22	56	1	3
Fuel Systems	10	25	28	70	2	5

Our schools are sometime accused of not providing training for people entering the foreign car agencies and other places that repair foreign cars. The employers were asked to assess the need for more training in this area.

Does your place of business include involvement with the foreign car market.

15 or 33% said yes, while 31 or 67% said No

If the employer answered yes to the above question he was asked if the graduates had the proper background for this work.

9 or 47% said Yes, while 10 or 53% said No.

SELECTED ACTIVITIES

A number of selected activities were listed and the employers were asked to indicate the amount of involvement they feel the average mechanic experiences in these activities.

Selected activity	Always (daily)		Frequently (weekly)		Occasionally (monthly		Never	
	#	%	#	%	#	%	#	%
Use equipment to diagnose problems	30	57	19	36	4	7	0	0
Solve customer Complaints	17	35	16	33	10	21	5	11
Sell merchandise	17	36	15	32	8	17	7	15
Act as a Service writer	5	10	13	27	19	40	11	23
Prepare repair estimates	10	23	6	14	19	43	9	20
Maintain equipment	31	69	4	9	9	20	1	2
Do mechanical Repairs to cars	35	75	5	11	3	6	4	8
Write technical Reports	4	9	10	21	14	30	19	40
Work on an assembly line	3	7	4	10	2	5	31	78
Run your own business	1	2	4	9	9	21	30	68
Manage a business for someone	1	2	4	9	16	37	22	52
Work for a parts department	3	7	6	13	20	44	16	36
Do used or new car prep	9	21	8	19	15	36	10	24
Maintain production Machinery	10	25	5	12	11	28	14	35
Work as a jobber salesman	2	5	1	2	11	25	30	68
Work as an auto service manager	2	5	6	14	13	31	21	50

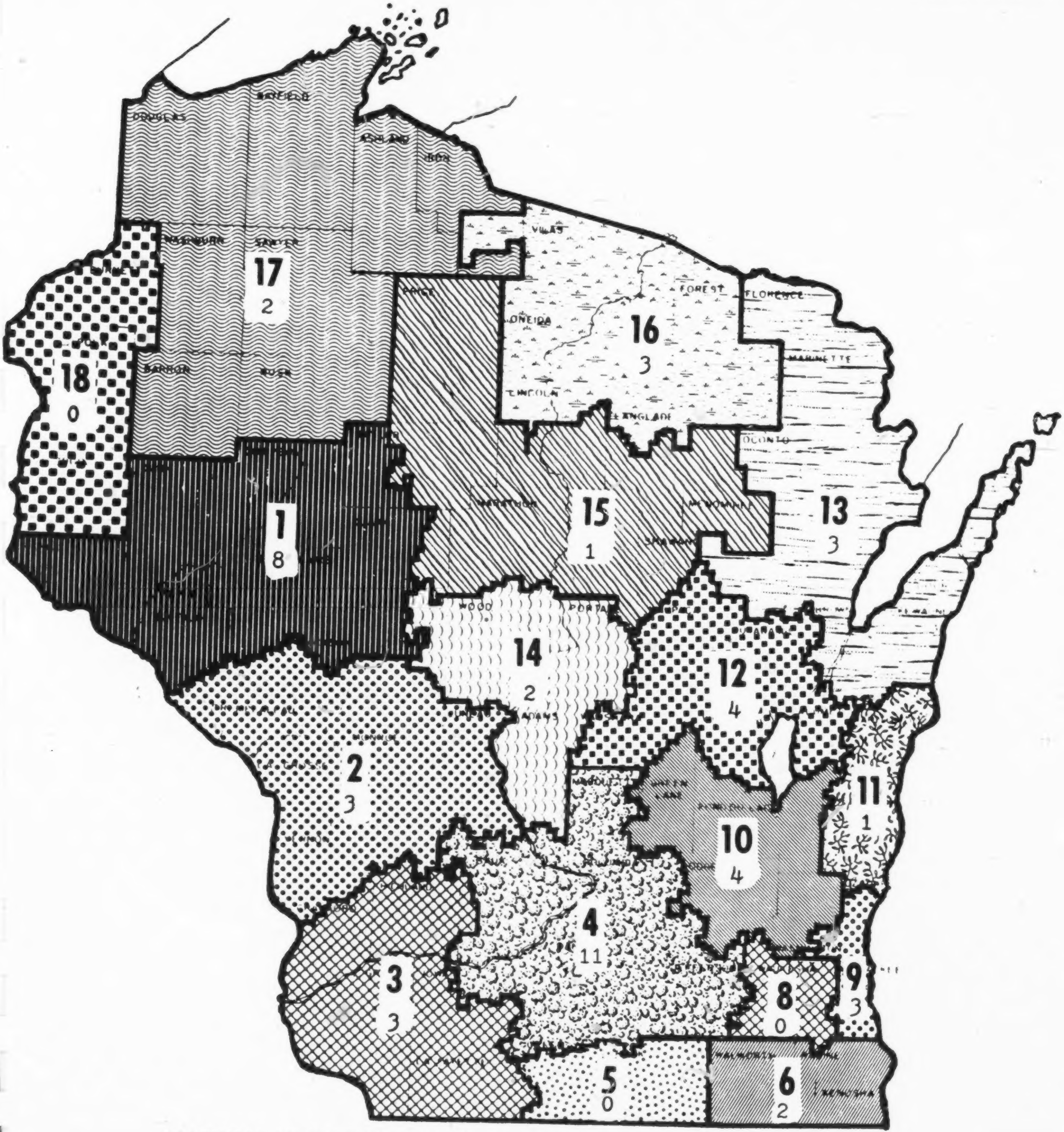
PERSONAL INTERVIEW SECTION

CHAPTER IV

State of Wisconsin \ BOARD OF VOCATIONAL, TECHNICAL & ADULT EDUCATION

Locations by district of personal visits by investigators.

EUGENE I. LEHRMANN
State Director
137 EAST WILSON STREET
MADISON, WISCONSIN 53703


DOUGLAS
BAYFIELD
ASHLAND
IRON
WASHBURN
SAWYER
17
2
18
0
BARRON
RUSK
PRICE
VILAS
ONEIDA
FOREST
FLORENCE
16
3
MARINETTE
LINCOLN
LANGLADE
OCONTO
1
8
MARATHON
15
1
SHAWANO
13
3
WOOD
PORTAGE
14
2
ADAMS
12
4
2
3
GREEN LAKE
FOND DU LAC
10
4
11
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11
3
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0
9
3
5
0
WALWORTH
KENOSHA
6
2

WISCONSIN VOCATIONAL, TECHNICAL AND ADULT EDUCATION DISTRICTS

APPROVED FOR OPERATION JULY 1, 1971

PERSONAL INTERVIEWS

The personal interviews section of this report includes data from the interviews only. 50 personal interviews were held, but only 29 of these interviews resulted in the interviewer being able to get the survey instrument completed. In all 50 interviews the investigators were able to obtain the opionions of the employers. These opinions are worth reading as they give a through look into what these employers think of our graduates.

The data included with this section of the report was the data collected with the 29 surveys that were filled out during the interviews. Only the general summary of this information is included on the premise that the mail returned report is very complete and reflects the views of the average automotive employer.

SUMMARY

Number of automotive mechanics employed:

A total of 171 mechanics were employed. This represents an average of 6 per employer.

What percent of your automotive mechanics are employed on a half time or less basis?

5 out of 171 or 3% were employed on this basis.

Approximately what percent of your automotive mechanics are employed directly from the vocational schools?

Out of 20 employers responding to the question, they indicate that 33% of their employees come from this source.

It should be noted that the above statistic on numbers employed from vocational schools cannot be used as a guide.

PERSONAL INTERVIEW SUMMARY (cont)

All employers interviewed said that direct contact with the school or the student was the method used to obtain the employees from our schools.

The average monthly pay for a beginning employee direct from the schools was $357.00.

In general, how would you rate the need for mathematics for the automotive mechanics?

Heavy use (daily)	Medium use (weekly)	Light use (monthly)	Never used
18	8	3	

This group of employers feels that the employee has heavy use for mathematics.

In general, how would you rate the need for science for the automotive mechanic?

Need more science	Present knowledge is sufficient	Little to No science is needed
4	22	4

Please rate the value of general education courses as they relate to the automotive mechanic doing his job.

Of great value	Of some value	Of little value
20	9	0

In general, would you like to see more sales and management courses taught, or would you rather see them taught less in schools for auto mechanics.

More	Less
17	5

Not all 29 employers responded to this question.

PERSONAL INTERVIEW SUMMARY (cont)

In general, the automotive mechanics use the information taught in the areas of metals and plastics.

Daily	Weekly	Monthly	Never
15	12	2	0

Does your place of business include involvement with the foreign car market?

Yes	No
9	7

If yes, do your mechanics have sufficient background to do foreign car repairs?

Yes	No
5	4

A total of 13 respondents did not answer this question at all.

The following pages contain the comments and remarks by some of the employers interviewed. These pages are worthwhile reading as they are the feelings of these employers regarding our graduates and our programs.

EMPLOYER COMMENTS

The following thirty two pages are comments concerning the graduates and the automotive programs. These are the comments that were collected by the personal interview method.

Most of the fellows don't want to work, lack ambition. They need to realize that they must start on the bottom to find out what they know and how badly they want to work.

They think that when they come from school they are fine mechanics. The students should be informed that they are not going to be line mechanics.

Whatever is necessary to make them think, that is what needs to be done. They have a lot of knowledge, but they don't visualize why they must do certain things, as why change oil in a car.

Teach them what an employer expects. They should be good salesmen for their employer.

There is a lack of good behavior. They don't know how to act, when to talk, and when not to talk.

They fail to understand that there must be a profit made in order for them to have a job.

They don't understand the theory of the electrical systems. More electrical and air conditioning study is needed. Study only the basics of automatic transmissions and specialize in the respective shop.

More need for body repair and refinishing.

The graduate mechanic does not understand the basics of greasing a car, changing the exhaust system, etc. They want the line job.

In school, often the problems of the cars brought into the lab dictated the course of study. Suggests the student work on a mockup engine, under structured process of learning.

Summary:

More emphasis needs to be placed on the development of attitude toward work. The importance of experience as well as knowledge should be noted. There is a weakness in the areas of customer relations and employer-employee relations. Acceptable behavior needs to be outlined.

The concept of operation for profit needs clarification.

Weak in electrical systems, air conditioning, body repair and refinishing. Devote less time to automatic transmissions; specialize on the job.

The student should work on a mockup engine under a structured process of learning.

Business:

Interviewed:

Comments:

Mr. believed that most instructors at the schools were very knowledgeable and did a good job of teaching. He believed the vocational schools are keeping up to date on modern equipment for testing.

Knowledge of principles of engine operation and electrical systems is quite satisfactory with the graduate. Need to emphasize emission control systems although the graduate had some knowledge of the subject.

After the first year of school, allow the student to select a specialty area of concentration, such as air conditioning, transmissions, etc.

The graduate didn't like to work alone on large jobs.

Summary:

Instructors at the schools are knowledgeable and do a good job of teaching; schools are keeping up to date on testing equipment.

Graduates have adequate knowledge of the principles of engine operation and electrical systems. Emphasize emission control systems.

After the first year of school, allow the student to select a specialty area.

Salary:
$3.00 / hour

Business:

Interviewed:

Comments:

Attitude is the one most important trait needed by the person behind the counter, along with aptitude. Much of the work or business is on a personal basis, and the employee must have a very positive attitude toward the customer.

The number one priority is the customer, and each customer is treated equally.

If the employee has an open mind, the employer can mold him to meet the specific needs of the system. If the employee does not have an open mind, he cannot be molded.

Attitudes are developed from abilities, the desire to work, interest, and aptitude.

The employer must develop an incentive, interest, bonus, and reasonable benefits to the employee. At the same time, the employer expects a lot from the employee.

This employer is not concerned that the employee have a strong background in the automotive system operations.

Summary:

The most critical qualities of the vocational-technical school graduate are attitude and aptitude. The employer may provide further incentive through bonuses and other benefits, but he does so with expectations of the employee.

The graduate should realize that the number one priority is the customer.

Business:

Interviewed:

Comments:

The graduates of vocational school do not have a good basic knowledge of electrical systems. Would like the students to have a better understanding of the electrical scope.

Need more understanding of tires.

Only a basic knowledge of the cranking and ignition systems is necessary.

In some cases, the graduate mechanics do not speak out and try to sell themselves and/or the product to the customer.

They have a general good attitude toward work. This employer has experienced very little turnover. Generally quite satisfied with the student graduates.

Summary:

The graduates have a good basic knowledge of electrical systems --stress the electrical scope. Need more understanding of tires. Only a basic knowledge of cranking and ignition systems is necessary.

Place more emphasis on customer relations and salesmanship.

Has found a general good attitude toward work among the graduates. Is quite satisfied with the student graduates.

Salary:
$160 / week plus
$2.25 / hour minimum

Business:

Interviewed:

Comments:

The problems encountered in the shop are a lot different than they are in the school.

More screening before going into the auto track; some apparently not inclined in the auto mechanics field.

The students might select one particular area and specialize in it, mainly in the mechanical end such as differentials, transmissions, etc. At the same time, obtain general knowledge in the other areas.

There is demand for a good automatic transmission man. Do not need a lot of specialized training for a particular company in automatic transmissions as the employer will send him to a specialized school.

There is a great demand for air conditioning mechanics.

The tune-up mechanic needs in-depth knowledge of pollution control. All graduates should have knowledge of this area.

Get some experience on trucks, air brake systems, trailer systems.

Spend more time on safety in whatever they are doing.

The graduates have a satisfactory understanding of brakes, electrical systems, and engines.

There is no need for clerical experience.

Most of the graduates have good customer relations and fellow-worker relationships.

When the mechanics are under the apprentice program, they don't apply themselves as they should and their productivity is at a low level. There is not much concern for their employer. Stress that if the mechanic is good for his employer, he increases his own security on the job.

Summary:

Students should consider specialization in one particular area. School should conduct more screening of the students' avocational choices.

Disparity between school lab problems and on-the-job problems.

There is demand for automatic transmission and air conditioning mechanics.

Technical areas to emphasize include pollution control, trucks, air brake systems, trailer systems. Stress safety in all areas.

The graduates have a satisfactory understanding of brakes, electrical systems, and engines. There is no need for clerical experience.

Most graduates have good customer relations and fellow worker relationships.

Work attitudes need improvement. Relate his productivity to the whole picture.

Apprentice freshman salary
is 60% of $4.50.

Business:

Interviewed:

Comments:

It is a "must" for graduates to be knowledgeable about air conditioning. Emphasize emission control system--it is becoming more important year after year.

More emphasis needs to be put on the test equipment. There is too much guessing, which causes the customer cost to go up and develops poor customer relations.

Instill in the student the necessity of being accurate, and not part correct.

Public relations should receive more emphasis. All mechanics are involved with the customer. They need to understand what to say and what not to say.

The graduate seems to lack enthusiasm, and in some instances, is not interested in becoming a first rate mechanic.

The employer should not expect the mechanic to make him much money during the first year.

Summary:

Technical skills that need emphasis include air conditioning, emission control systems, and test equipment. Accuracy in all areas is a must.

Further develop the student in good public relations principles. If possible, create enthusiasm for their profession.

Business:

Interviewed:

Comments:

The graduates have a good knowledge of electrical diagnosis. Knowledge of engine overhaul is good. They could use more specialization in automatic transmissions. They also need a good background in air conditioning. Background of the emission control systems is necessary, although the federal government does not allow much work on them.

The graduate mechanic must have background in alignment and suspension work. They need to be able to do alignment and know how to correct related problems.

The graduates do understand the manuals well and how to use them.

The graduate mechanic needs to realize that he should be able to increase his speed on the job. Many are not aware of why they should do a good job, e.g., for promotion and/or better salary.

The mechanics need more study in business economics. They need to learn why the customer must pay a given price in order for the business to keep going. The mechanics do not understand what is going on in the financial world; many come from families where they would not learn this concept.

Stress customer relations. When to speak and what to say is important. They need a mastery of English.

Summary:

Complimented the graduate mechanics on electrical diagnosis, engine overhaul, understanding and use of manuals.

Expressed need for more emphasis in technical areas of automatic transmissions, air conditioning, emission control systems, alignment and suspension.

More study of business economics is needed. Stress necessity of profit margin. They should be familiar with financial concepts.

Emphasize customer relations.

Relate mechanic efficiency to salary increases and promotions.

Business:

Interviewed:

(This business primarily works with lift trucks.)

Comments:

There is a great demand for lift truck mechanics.

Electric lift trucks are the coming power drive unit as they usually operate in an enclosure.

The graduates have little hydraulics experience or electronic knowledge. There is a real lack of knowledge of the electrical systems.

Knowledge of LP and standard gas is needed. Good welding experience is needed.

Rapport with customers is usually good.

Summary:

There is a great demand for lift truck mechanics. Give some attention to electric lift trucks.

The graduates need experience in hydraulics and welding. Stress electrical systems, electronics, LP and standard gas.

Customer relations is good.

Salary:

New men	$3.95
Experienced mechanic	$4.55

Business:

Interviewed:

Comments:

Mr. is satisfied with the graduate mechanic.

The graduate should have a good general background of automotive basics and specialize in one or two areas, e.g., air conditioning.

The graduate mechanics are good on cranking systems and ignition systems. There is a lack of understanding of the alternator.

Stress neatness and cleanliness.

Customer relations is good. The mechanic needs to be able to write up what was done on a car to justify the labor to the customer's satisfaction.

Summary:

Mr. Tomasvewski is satisfied with the graduate mechanic.

The graduate should have a good general background and one or two specialties.

The graduate mechanics are good on cranking and ignition systems. Stress the alternator. Emphasize neatness and cleanliness. The mechanic needs to be able to write up the work done on a car.

Customer relations is good.

Business:

Interviewed:

Service Manager

Comments:

The students from the vocational schools who are auto mechanics have a lot more confidence than those who do not have vocational experience.

There is a great need for good mechanics, but the wages are going to have to improve. The student should be made aware of the wages and benefits of auto mechanics (which are very little).

Good human relations and personal contact from the mechanic to the customer is important.

The graduate mechanic understands engine overhaul, but needs more experience in electrical, charging, ignition, and starting systems. The graduate should understand the basic principles of emission control systems. The mechanic needs a lot of knowledge and experience in troubleshooting, especially in the areas of power windows, brake lights, backup lights, etc. In the wiring harnesses there are often pinched wires or other production problems. Body fitting (adjusting doors, etc.) and upholstery repair is necessary.

Summary:

Areas needing emphasis in the vocational school program include the electrical, charging, ignition, starting, and emission control systems; troubleshooting, particularly in the electrical system; body fitting and upholstery repair; and customer relations.

There is a need for vocational school graduate mechanics, but the graduate should be advised what to expect re: wages and benefits.

Business:

Interviewed:

Comments:

Do not understand the various electrical systems (cranking, charging, and ignition), or how to do basic troubleshooting. Need understanding of basic electrical principles. Weak in knowledge of disc brakes; do not know how to fix brake squeaks.

There is a need for a better understanding of the tune-up procedure.

Do not remember how to operate a scope. May not be the lack of responsibility of the school, but possibly the lack of recent experience on the part of the mechanic.

Need to emphasize the area of air conditioning.

The graduates are strong in automatic transmissions and engine rebuilding.

Do not understand that a profit must be made in order for the mechanic to be employed. The graduate mechanics did not have an understanding of the flat rate practice; they do not realize they cannot take unlimited time for a repair.

Fail to realize the graduate mechanic must serve the customer, serve the employer, and make a profit for the employer.

Need to fill the gap of communication with the customers. Ability to sell the customer on things that need to be replaced on the car.

Summary:

This employer found the graduate mechanic to be strong in the areas of automatic transmissions and engine rebuilding, but weak in electrical systems, disc brakes, tune-up procedures, scope operation, and air conditioning. He also noted a need for improvement in customer relations and operation of a business for a profit.

Business:

Interviewed:

Comments:

The schools should offer a good basic program in the respective fields of interest, and the graduate can then go into the field and learn the specialties.

Do not require so many unrelated courses in which the student is not interested, as this kills his educational incentive.

The work experience obtained through the school while the student is in school, or during the summer between the two years, is very worthwhile.

The graduate does not use the trigonometry and algebra much but a general background is good.

Psychology related to the specific area of study is worthwhile and should be continued.

Need more study on how the parts catalog system works--how to use the catalog to locate parts.

Schools do not teach bookkeeping relevant to the specific areas of study.

The student should learn how to do diagnostic work on the electrical systems without the use of expensive test equipment. Many shops do not have this test equipment.

The basic theory of emission control systems should be taught, but the specific skills related to the different makes and models will be acquired in the field.

Summary:

The educational program should offer a strong basic program with less emphasis on specific skills which can be acquired on-the-job. Do not require the student to take many courses unrelated to his major, although a general background in trigonometry, algebra and psychology is worthwhile.

Areas needing further emphasis include the parts catalog system, electrical system diagnosis without expensive test equipment, general knowledge of emission control systems, and bookkeeping related to specific areas of study.

Business:

Interviewed:

Comments:

Feels the graduate is getting more education on-the-job than at the school. Feels there are poor teachers and poor discipline within the schools.

The machine education the students receive in the vocational schools is satisfactory; the graduates will specialize at the industry.

Vocational school will give the students the automotive fundamentals; the graduates may then go to specialized schools to develop a specialty in a given area, e.g., automatic transmissions.

A good math background is needed. Not so much emphasis on algebra and trigonometry, but be able to read instruments, e.g., dial indicators, micrometers, calipers.

Skills desired, but often lacking, in automotive graduates: how to do inventory, inventory card filing, and record keeping of what is in stock. Proper valve adjustment and grinding.

Summary:

Qualifications of teachers and discipline of students within vocational-technical schools need scrutiny.

Automotive fundamentals and machine education as taught in the vocational schools are satisfactory; graduates may develop a specialty by further training at a specialized school or on-the-job.

A general background in math is needed. Technical skills deserving emphasis include inventory maintenance, proper valve adjustment and grinding, and instrument reading.

Business

(Sells parts)

Interviewed:

Comments:

Believes auto mechanic courses are adequate. Also small engine and marine engine curriculums are good.

Many students don't know how to handle customers and schools should give more direction. The graduate has to be a mechanic, salesman, and preacher. He needs to possess good selling ability, and personality is very important in sales.

There is not sufficient emphasis placed on how a business is run and that a profit must be made to succeed.

No problem with emission control in this business.

Need more knowledge in welding and welding equipment. More emphasis needs to be put on front-end principles of operation and chassis; frame alignment and front-end alignment; wheel balancing; body finishing and painting; farm and tractor mechanics; and electrical systems.

Summary:

In general, courses in auto mechanics, small engine, and marine engine are adequate. Customer relations, salesmanship, and operation of a business need to be stressed.

Need more knowledge of welding and welding equipment; front-end and chassis; frame and front-end alignment; wheel balancing; body finishing and painting; farm and tractor mechanics; and electrical systems.

Business:

Interviewed:

Comments:

The program should be longer. Too much on the very basics.

Graduates fail to understand that they must make a profit for their employer, or they are not any good. Need (1) good communication with customer, (2) salesmanship, and then (3) mechanical ability. If you don't have the customers you don't need the machanical ability. Should let the customer watch you work in order to build his confidence in you as a mechanic; tell him what you are doing to his car. Many mechanics lack tact and courtesy and are too cocky with the customer.

They are not cleanliness conscious. A clean mechanic is a good mechanic. Keep the shop clean and organized.

Need to have a basic knowledge of how a shop is run.

The average garage is geared to tune-up, brake overhaul, emission control, carburetion, etc., and these areas should be stressed in the school. Engine overhaul is not too important; it is a specialty and done in an engine overhaul shop.

Need to establish a procedure for tune-up, brake, and other types of work. Many graduates don't know how to clean wheel bearings, pack them, take them out of the wheel, etc.

Place more stress on electrical system diagnosis outside of the ignition, charging, and starter systems, e.g., lights, radio, panel lights. Should know the electrical theory.

More emphasis needed on front-end alignment and diagnosis of front-end problems of all kinds. Need to know how to make safety checks, which serve the customers and make a profit for the employer.

Summary:

Emphasis needs to be placed on communication with the customer (customer relations), salesmanship, tact and courtesy. The graduate needs to understand the operation of a business and necessity of profit. Clearnliness and organization should be Stressed through practice.

Establish and teach a procedure for tune-up, brake overhaul, and other types of work. Stress these procedures and emission control, carburetion, and place less emphasis on engine overhaul.

More knowledge is needed of diagnosis of front-end problems of all kinds and electrical system diagnosis for areas other than ignition, charging and starter systems. Know how to make safety checks.

Business:

Interviewed:

Comments:

Graduates of vocational-technical schools should possess a positive attitude toward their work.

There is a great demand for expertise in air conditioning and emission control systems.

Summary:

Single, most important attribute desired is a positive attitude toward their work. Technical areas to be emphasized would be air conditioning and emission control systems.

Business:

Interviewed:

Comments:

Mechanics in this shop do more assembly work, not so much automotive mechanic repair except with Air Force trucks.

Looks for vocational graduate rather than off-the-street person when hiring. Believes the vocational school, in Oshkosh, in field of automotive mechanics is doing an excellent job.

These areas must be emphasized to young people:

1. Respect for authority.
2. Recognition that they are selling their time and talents.
3. Employer has right to require certain things from an employee.
4. Customers go through the plant and observe employees at work.
5. Realization that the customers are the boss. They must please the customers. If there is no profit, a job won't exist.

Feels the unions don't really serve a positive purpose. Graduates begin employment with a very positive attitude; after six months, the union somehow destroys some of this in some employees. Need to realize there are two sides to all stories. Be more positive in their work.

Math background necessary if they are going to advance in machine shop. Shop math is sufficient for automotive work. Importance of algebra and trigonometry depends upon how far they want to advance.

Place more emphasis on blueprint reading. Need drafting experience to conceptualize three dimensional objects. Be able to read technical manuals, bill of materials, schematic drawings, understand specifications.

Need more emphasis on metal fabric, welding, sheering, metallurgy, strain on metal. Need to achieve better use of tools.

Teach basic principles of how dynamometer works; specialized training on operation of dynamometer can be obtained on the job.

Concentrate on the fundamentals.

Summary:

Develop positive attitudes toward their work. Emphasize respect for authority, recognition that they are selling their time and talents, customer relations, profit concept. Explain unions.

Concentrate on the fundamentals of automotive mechanics. A math background is necessary. Place more emphasis on blueprint reading, ability to read technical manuals, bill of materials, schematic drawings, specifications. Need more study on metal fabric, welding, sheering, metallurgy, strain on metal, basic principles of the dynamometer. Work to achieve better use of tools.

Business:

Interviewed:

Comments:

Need a lot of practical experience, along with classroom theory on all aspects.

Need more education in areas of chassis and ride control. Knowledge of emission control and air conditioning is in great demand.

Need a good general knowledge of all phases of electrical systems.

Summary:

The student should graduate with an understanding of the theory, as well as practical experience regarding automotive maintenance and repair. Areas to receive particular emphasis are chassis and ride control, emission control, air conditioning, and electrical systems.

Business:

Interviewed:

Comments

He looks for these attributes in an individual when considering employment: ability to work with humbers, appearance, and a high school education.

Good human relations is most important.

Employees lack a positive attitude toward interests of their employers. Returning to work following the noon hour break is an example of their unwillingness to work until it is time to work.

There is a lack of understanding of how the system works from manufacturer to wholesaler to jobber, e.g., why it is possible to buy cheaper from Fleet Farm than from jobber.

Learn stock and control of stock. Have an understanding of the components and know what the part looks like.

Comments (Employees):

More emphasis needed on salesmanship: selling the product (why the customer should buy a particular item over another item) and selling yourself to the public. Revise course in psychology to meet specific needs, e.g., meeting people.

A course is needed on how to use parts catalog and price sheets; how to identify parts by customer descriptions. Need more teaching aids.

Get into more transmissions and actually show the items to the students.

Some employers didn't seem to care that they had graduated from a vocational school.

Summary (Mr. McCaben):

Emphasize development of good human relations and employer-employee relations. Also stress importance of appearance.

The graduate in this field must understand how the system works (from manufacturer to wholesaler to jobber). He must learn stock and control of sotck, understand components and know what the part looks like.

Summary (Employees):

More education needed to develop qualities of salesmanship and customer relations. Add information on parts catalog and price sheets to the program. More in-depth study needed on transmissions; use visuals.

Need to educate possible future employers on advantages of hiring vocational school graduates.

Business:

Interviewed:

Comments:

The vocational-technical school falls short in general education: cannot properly read manuals, electrical diagrams, and vacuum systems.

The student needs a general automotive background rather than specializing in one area. The specialist will not get the job as there is not enough work in one specific area.

The mechanic must understand the theory of the various systems --electrical, fuel, etc.

Little is needed in the sciences beyond a general background. Blueprint reading not necessary.

The mechanic must be able to get along with the customer and fellow workers. Good appearance is important. Suggests a survey of the customers to find out what they feel.

Try to get manufacturers to financially support the students in automotive vocational education. Possible in-service training.

Vocational-technical schools should teach attitude and professionalism. Encourage self-study and self-responsibility, which result in promotions, etc.

Schools should have diagnosis equipment. Many mechanics do not understand correct diagnosis procedure; need to learn how to approach a problem. The graduate mechanic should have a good understanding of tolerance and how to read instruments. The school should teach something about the metric system. An understanding of warranty is needed; some mechanics take longer on a job than they should.

Would give them on job training if they understood the basics.

Summary:

The vocational-technical schools need to provide a good general education and general background in automotive mechanics rather than specializing in one area. Theory should be stressed. Involve manufacturers if possible.

Vocational-technical schools should teach attitude and professionalism.

Customer relations and employee-employee relations are important. Also stress appearance.

Technical skills to be given special consideration include diagnosis procedure (and how to approach a problem), tolerance and instrument reading. An understanding of the metric system and of warranty procedures would be helpful.

Business:

Interviewed:

Comments:

The educational program needs to put more emphasis on:

1. Basic service work, sales, product knowledge.
2. Good basic knowledge of electricity.
3. Ignition system.
4. Tune-up procedure.
5. Basic principles of operation of the respective systems (teach the broad concept and then work on the specifics).
6. A broad program rather than in-depth specifics.
7. Components and what they are supposed to do.
8. Air conditioning (apparently not taught at all in the schools).
9. Up-to-date teaching (don't use old techniques).
10. A program for service stations with less time spent on transmissions and engine overhaul.

Personality and attitude are big factors, although as such, may not be able to be taught in schools.

This employer noted that too many young people feel they don't need to work unless they can make $5.00 / hour, whether or not they know or can do anything.

His employees are more profit conscious since he has put them on an hourly rate plus commission.

Summary:

The needs pointed out include a broad educational program that would stress the basic principles of operation of the systems and a working knowledge of the components. Specific areas of need include basic service work, tune-up procedure, sales, product knowledge, basics of electricity, ignition systems, and air conditioning. In all, there is a need to use up-to-date techniques of teaching. Personality and attitude should not be ignored.

Business:

Interviewed:

Comments:

Emphasis should be given to air conditioning, brakes, and tune-up. More study is needed of cooling system diagnosis. Teach the students how to approach an electrical problem or diagnostic procedure; also need to know how to check out an alternator, battery, starter, etc.

The study of air conditioning is very important; also study, to some degree, the emission control system.

A thorough knowledge of the scope is helpful, yet some people with a good background and lots of experience do not need the scope a great deal.

Service stations are not designed for engine rebuilding, transmission work. Emphasis on tires and wheel balancing not needed.

Although the service station is not involved with diesel engines too much, there is a great demand for good diesel mechanics. Mr. Tilot would set up a diesel service if he could find a good diesel mechanic.

Instill within the student the concept of selling the product to make a profit. The graduate needs to be able to do basic bookwork and math.

Bookkeeping and good business people are scarce. If the graduate mechanic possesses these abilities, he could develop a business of his own rather than working for someone else forever.

Stress the importance of customer relations. A good employee has mechanical ability, looks neat, can read and write.

Summary:

Technical areas which should be emphasized include air conditioning, brakes, tune-up, cooling system diagnosis, electrical systems, diagnostic procedure, alternator, battery, starter, and the scope.

Areas that do not need special emphasis for the service station employee include engine rebuilding, transmissions, tires, and wheel balancing.

The ability to do basic bookwork and math is important. The graduate should understand the concept of selling the product to make a profit.

Stress customer relations.

Business:

Interviewed:

(Company emphasis is on diesel mechanics.)

Comments:

There is a demand for more diesel mechanics; there is no diesel vocational school in the Green Bay area. Need for truck mechanics and some emphasis should be placed on this area when teaching auto mechanics.

They need more in-depth understanding of the electrical system.

Emphasize the need to record the work done on an engine, vehicle mileage when work was done, the importance of keeping a good maintenance record of each engine.

Need more study on air brakes.

Develop the correct attitude toward work and interest in doing a good job. Too much concern given to the union; workers hide behind the union and don't do a good job.

Summary:

There is a real need for diesel and truck mechanics. Emphasis should be given to these areas when teaching auto mechanics.

Study air brakes and the electrical system. Learn to keep engine maintenance records.

Help students develop the correct work attitude and interest in doing a good job.

Business:

Interviewed:

Comments:

Fellows with insufficient ability are being put into the automotive field. Employees must have ability to reason. A good employee must know how to write.

Graduates are weak on theory.

Need to know the entire procedure for running your own business, including the bookkeeping procedure. Be able to read a catalog and make out a work order. Teach that a profit must be made in order to operate a business.

Stress the importance of making a good impression with the customer.

Without question, electricity needs emphasizing. Wiring harnesses are in need of study. Need to be able to read a schematic of electricity. There is a lack of understanding of heat loss.

Summary:

An employee in the automotive field must understand the theory, and have ability to reason and to write. The graduate mechanic should understand the operation of a business, the profit concept, be able to do bookkeeping, read a catalog and make out a work order. Customer relations should also be stressed.

Technical areas to be emphasized include electricity, electric schematics, wiring harnesses, and the concepts of heat loss.

Business:

Interviewed:

Comments:

Would like to see the schools strongly encourage the students to go into a specialty, such as automatic transmissions. This business could employ a full-time automatic transmission man. Along with the specialty, a general auto mechanic background is needed.

Do not stress engine overhaul. Most of this is done in a machine shop or traded for a short block. Valve and head work is sufficient.

Stress the electrical diagnosis procedure and the individual electrical systems. Put more emphasis on power steering.

No real demand at the present for emission control as it is usually ignored.

Schools apparently do a good job in teaching students how to write up repair orders, work performed, and parts supplied.

Impress upon the students that their attitude and personality is important to them and to their employer. The graduates do a good job in looking out for the employer.

Good public relations should be highly stressed. The graduates need to realize the customer is their paycheck. Need to listen to the customer, judge the customer's personality, and work with him as indicated.

Summary:

In addition to acquiring a general auto mechanic background, encourage students to specialize in an area, such as automatic transmissions.

Technical areas that do not require emphasis include engine overhaul and emission control. Do stress electrical diagnosis procedure, electrical systems, and power steering.

Knowledge in writing up repair orders is good.

Impress upon students the importance of their attitude and personality. Place much emphasis on public relations. Explain the relationship between the customer and their paycheck.

Salary: $2.10 / hour

ONE AND TWO YEAR DIPLOMA PROGRAMS SECTION

EMPLOYEE SURVEY DATA

The table below contains the data describing the number of graduates contacted by the survey. One and two year diploma programs and associate degree programs. (described by district)

DISTRICT	Number of Surveys	Diploma Programs		Associate Degree	
		Returned	Not Returned	Returned	Not Returned
1	107	29	78		
2	70	2	68		
3	14	4	10		
4	157 *59	43	114	15	44
6	75 *44	14	61	12	32
9	86 *21	32	54	6	15
10	56	18	38		
11	48	12	36		
12	70 *36	19	51	10	26
13	123	24	99		
14	41	11	30		
15	107	37	70		
16	38	8	30		
17	62	19	43		
Totals	1054 *160	272	782	53	117

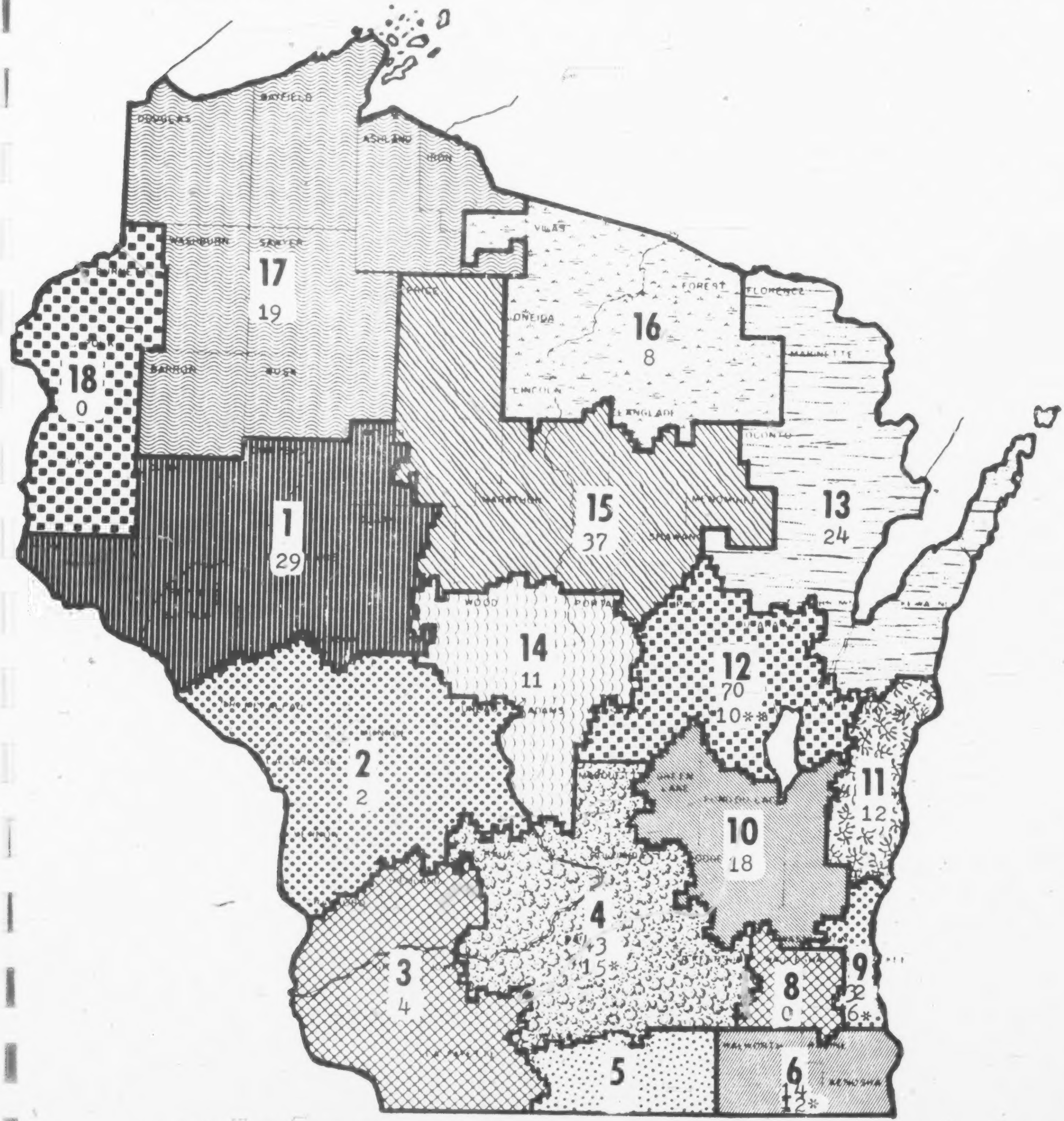
* Associate degree

One and two year diploma 26% returns
Associate degree 33% returns

State of Wisconsin \ BOARD OF VOCATIONAL, TECHNICAL & ADULT EDUCATION

EUGENE I. LEHRMANN
State Director
137 EAST WILSON STREET
MADISON, WISCONSIN 53703

Locations of respondents for one and two year diploma and associate degree program graduates.


DOUGLAS
BAYFIELD
ASHLAND
IRON
VILAS
WASHBURN
SAWYER
BURNETT
17
19
FOREST
FLORENCE
PRICE
ONEIDA
16
8
MARINETTE
18
0
BARRON
RUSK
LINCOLN
LANGLADE
OCONTO
MARATHON
MENOMINEE
SHAWANO
1
29
15
37
13
24
WOOD
PORTAGE
14
11
12
70
10**
ADAMS
2
2
GREEN LAKE
FOND DU LAC
11
12
10
18
DODGE
4
3
15*
3
4
8
0
9
32
6*
5
WALWORTH
RACINE
KENOSHA
6
14
12*

WISCONSIN VOCATIONAL, TECHNICAL AND ADULT EDUCATION DISTRICTS

APPROVED FOR OPERATION JULY 1, 1971

PERSONAL DATA: One and two year diploma programs.

The following chart indicates the years from which the graduates responding to the survey graduated.

Year of graduation	Number	Percent
67	27	10
68	40	15
69	49	18
70	63	23
71	93	34
Totals	272	100%

EMPLOYMENT DATA:

What is your present employment status?

Status	Number	Percent
Full time	250	93
Part time	8	3
Unemployed	10	4
Military Service	24	9
Totals	268	109

The numbers and percentages do not add properly because, some graduates checked both full time and military.

EMPLOYMENT DATA (cont)

Question asked: How well does your automotive training relate to your present job?

Relationship	Number	Percent
Directily related	167	62
Somewhat related	62	23
Not related	40	15
Totals	269	100%

Although 85% of the graduates indicate that they work in directly related or somewhat related jobs, a significant amount of graduates (15%) are not getting jobs related to their training.

The following chart relates to the job titles that were reported by the graduates. Job titles of an automotive nature are listed and the statistics recorded. Any job not directly related to the automotive field is listed as miscellaneous.

Title	Number	Percent
Mechanics or Technicians	151	62
Service Manager	13	6
Equipment Maintenance	2	1
Misscellanous	76	31
Totals	242	100%

EMPLOYMENT DATA (cont)
One and two year diploma programs

The respondent was asked to indicate the length of time that he held each job. To get an indication of whether the graduates are getting jobs and sticking to them the statistics for the last job listed on the survey was recorded. The data is listed by a span of months and by the number and percent holding a job for that particular span.

Length of job in months	Number	Percent
1-6	37	14.5
7-12	71	28
13-24	63	25
25-48 or more	83	32.5
Totals	261	100%

The graduates were asked if their initial job was obtained before their graduation date. This data gives an indication of the numbers of students that are working in the automotive field while attending school. Only jobs considered automotive in nature were to be considered by the respondent.

Job Obtained	Number	Percent
Before Graduation	148	57
After Graduation	113	43

The above charts indicate that the average graduate obtains a job before graduation and tends to hold his present job 24 monthsor longer.

EMPLOYMENT DATA (cont)
One and two year diploma programs

Question asked: What assistance did you have in obtaining your initial job?

Catagory	Number	Percent
Friend	89	33
Parent	33	12
School Guidance & Placement	15	5.5
Teacher	21	8
Wisconsin Employment Serv.	13	5
Newspaper Ad.	28	10.5
Dept Head	2	1
Other	66	25
Totals	267	100%

It appears that friends produce more jobs in the automotive field than any other source. It appears that our schools are not doing the job of placing graduates. It is recommended that more effort to develop a working relationship with industry to help improve our placement record.

Degree of job satisfaction expressed by district.

How do you like your present job?

DISTRICT NUMBER	I am very pleased	I am fairly satisfied	I am satisfied but plan to change jobs	I dislike my job, I will change jobs
1	10	9	8	1
2	1	0	1	0
3	0	1	2	0
4	18	9	13	1
6	5	6	5	2
9	10	6	5	2
10	9	6	1	2
11	5	2	4	1
12	4	5	6	8
13	10	9	4	1
14	2	5	3	2
15	9	10	14	2
16	0	2	5	0
17	8	5	4	2
Totals	91	75	80	24

Automechanics, one and two year diploma programs.
Data is expressed in number of graduates only.

Average monthly rates of pay for graduates at the time of job entry .

Automechanics programs- One and two year diploma programs

DISTRICT	1	2	3	4	6	9	10	11	12	13	14	15	16	17	%
Under $400	20	2	1	15	13	13	10	10	10	16	8	21	5	15	61
$400-$500	5	1	19	3	11	3	2	7	5	3	10	3	2	1	28
$500-$600	1		1	7	1	3	2		1	1		3			8
$600-$700				1		2	1			1	1				2
$700-$800				1									1		.5
$800-$900															
$900-$1000														1	.5
Over $1000															
Average monthly rates of pay for graduates at the time of survey.															
Under $400	8	1	1	3	5	8	4	4	4	4	2	11	8	7	26
$400-$500	7	1		9	5	6	6	2	7	10	6	11	4	4	30
$500-$600	6		1	10	2	6	2	2	4	3	2	7		5	19
$600-$700	4			12	2	4	2	2	2	2	1	2		1	13
$700-$800	1		1		2	1	1	1	1	3		2			5
$800-$900				4		4	1		1		1				4
$900-$1000				2				1							1
Over $1000				1			1					1			1

MATHEMATICS

The following information is the subject evaluation for the area of mathematics for automechanics in one and two year diploma programs.

The question asked: (Please rate the amount of knowledge that you as an automotive mechanic feel is essential to do the type of work you are presently performing.)

MATHEMATICS	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary		No Response
	#	%	#	%	#	%	
Basic Mathematics	208	78	53	20	6	2	
Algebra	37	14	127	49	98	37	
Slide rule use	15	6	73	28	169	66	
Fractions	141	53	103	39	21	8	
Powers and roots	16	7	77	31	152	62	

The following information is the use rating given the subject of mathematics by graduates from the one and two year diploma automechanics. The information is recorded by district.

Information asked for: (In general how would you rate the need for mathematics in your present job?)

The data is recorded by number of graduates only.

DISTRICT	Heavy use	Medium use	Light use	Never used
1	8	13	5	1
2	1	0	1	0
3	0	2	1	0
4	28	13	8	0
6	8	7	4	2
9	9	11	9	0
10	8	7	1	0
11	4	5	1	1
12	6	13	2	0
13	11	6	6	0
14	7	5	0	0
15	18	14	5	1
16	2	2	3	2
17	6	10	2	1
TOTALS	116	112	48	8

COMMENTS
For The Area Of Mathematics
Graduate Responses

"A math course is helpful, especially in fractions."

"Sometimes you could use more math."

"You use mathematics during every job figuring out what the cost will be to do the job for the customer."

"Need more on decimal equivalents."

"I feel that math plays an important role in a mechanic role and I feel that my knowledge of math will help me."

"Basic math is essential, also we use micrometers and feeler gauges and proper use of these are important. I wish I would have had more math as far as figuring gear ratios, cubic inch displacement etc. I had it, but it didn't stick."

"Basic math for estimates and labor rates, parts and materials. Suggest more time spent on metric system."

"Knowledge of advanced math is not necessary, but sometimes helpful."

"The subjects we had were good if only all the teacher would have taught them in direct relation to auto mechanics."

" I feel that even though you may not use directly in the job you are schooling for, but when the chance for advancement or more schooling come along it is essential."

"Daily use of math, but not very complex math. Subraction and addition."

"Math in my job is mostly in connection with weights and tolerances and speed formulation."

"Basic math and decimals are absolutely essential."

"I work as a lumber piler and at the end of the day you have to figure out the amount of footage you have piled during the day."

SCIENCE

The following information is the subject evaluation for the area of science for the two year associate degree programs.

Information requested: Please rate the amount of knowledge that you as an automotive mechanic feel is essential to do the type of work you are presently performing.

General Science Subject Areas.

SCIENCE	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Chemistry	16	6	123	46	127	48
Physics	33	13	105	40	125	47
Basic Science	88	33	117	45	60	22
Specific Subject Areas						
	#	%	#	%	#	%
Properties of liquids	8[illegible]	30	132	49	58	21
Change of State	68	25	133	50	66	24
Heat	132	50	106	40	29	10
Light	78	30	122	46	65	24
Sound	94	35	113	43	59	22
Magnetism	114	43	99	38	49	19
AC and DC Electricity	194	72	56	20	21	8
Refrigeration	92	35	108	40	65	25
Work & energy Formulas	55	20	117	44	98	36
Electronic Theory	96	36	108	40	64	24

SCIENCE (cont)

Automechanics do not place a high value on science courses in relationship to their present jobs. Most graduates however, do feel that science rates at least Some knowledge necessary. It is interesting to see that all but 16% of the respondents indicate that some science beyond high school is needed.

Question asked: How would you rate the need for science courses in curriculms of the auto mechanics programs?

Need category	Number	Percent
Present courses are adequate	155	58
More science is needed	70	26
Less science is needed	22	8.5
No science beyond High School	20	7.5
Totals	267	100%

Many principles used in teaching automotive subjects are in the area of physics and science. It becomes the job of automotive instructors to do a better job of selling the value of these subjects. More cooperation and communication between instructors in the automotive and science areas seems to be needed.

COMMENTS
For The Area Of Science
Graduate Responses

"Some knowledge of science is good, but not a great deal of time should be spent on science."

"Most of my science needs are for background in writing technical articles."

"Practical training on the subject itself, such as electrical systems and more in the mechanical field to help with experience on the job."

"More new things are learned everyday and I think a person should know more about them."

"A much more basic science course is needed."

"I had science in gigh school and this gave me 80% of the knowledge required for auto mechanics."

"I hate sciences."

"Courses are adequate, but should pertain to trade being studied."

"To my past experience the need for science is not needed that much."

"I do not think it is really necessary, but in my case I took an extra course in science while in tech school and I think it helped me some."

"The knowledge of chemistry helps you know what happens to oil inside an engine, coolant in a cooling system and explain why preventative maintainance is necessary."

"More on properties of liquids, heat, magnetism and electrictiy."

"There isn't a great need for science because the only things that are taught in that course are usually taught over in the shop theory course."

"Only science dealing with engine metal and body metal directly relating, not general science."

"I would like to see more on A.C. and D.C. electricity and electronic theory."

GENERAL EDUCATION

The following information is the subject evaluation for the area of general education. The information is for the one and two year diploma programs.

Information requested: Please rate the degree of knowledge that you as an automotive mechanic feel is essential to do the type of work you are presently performing.

General Education	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
General English	123	46	127	47	20	7
Speech	120	44	119	44	33	12
Report writing	71	27	127	48	65	25
Economics	84	32	124	46	60	22
Human Relations	190	70	71	26	10	4

Human Relations received a very high rating, with only 4% of the respondents indicating "no knowledge necessary". The area of Human Relations is also held in high regard by the employers.

GENERAL EDUCATION (cont)

The graduates were asked to rate the general education subjects as to their value in their present job.

Information requested: In general, how would you rate the need or value of general education courses as they relate to your present job.

VALUE RATING	Number	Percent
Of great value	114	44.5
Of some value	124	48.5
Of little value	16	6
Of no value	2	1
Totals	256	100%

This information is a valuable tool to take to the students involved in our automotive programs. It is apparent by the response that graduates do recognize the value of general education. Many students complain the most about these subjects. It is worth noting that graduates do not feel that our schools are wrong in teaching these subjects.

COMMENTS
For The Area Of General Education
Graduate Responses

"All of the general education subjects are important when trying to express yourself, or explain various procedures to fellow employees or customers."

"Human relations is very important no matter what your occupation is."

"I think general education before hand is very good because it helps a person get along with others and gives him a chance to express himself properly with others."

"Human relations and customer relations are quite important in my job."

"I feel that the vocational schools should push more human relations and report writing, mainly in the field of description writing."

"These subjects are very important to me in management, where a general mechanic does not need them as much."

"Human relations was put to good use."

"High School english courses, I feel are adequate."

"The courses aren't too bad as are."

"If a person didn't care to learn english in grade and high school, he isn't going to learn it in technical college."

"Human relations was the only subject of value to the jobs I studied for."

"Main use for these courses is in dealing with customers."

"I feel these courses are essential whenever you have to deal with people. Also, the economics related courses are helpful in my own personal life."

At least 20 of these comments concerned the high value placed on human relations courses.

SALES AND MANAGEMENT

The following information is the subject evaluation for the subjects of sales and management. The respondents are from the one and two year diploma programs.

Information requested: Please rate the degree of Knowledge that you as an automotive mechanic feel is essential to do the type of work you are presently performing.

Sales and Management	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Sales methods	122	46	108	41	35	13
Business Management	125	47	91	34	49	19
Marketing	70	27	117	45	72	28
Insurance	69	27	133	51	57	22
Finance	83	31	124	47	57	22
Retail selling	88	34	106	42	61	24
Customer Relations	191	69	67	24	18	7
Public Relations	191	69	67	24	18	7

The graduates were asked: In general, would you like to see more of these type of courses taught or would you rather see them taught less?

Of the 235 respondents 179 or 76% indicate they feel that more of these subjects should be taught, while 56 or 24% indicate that they would prefer them to be taught less.

Many comments in this section lend themselves to indicate that many graduates feel that these subjects come in handy several years after graduation. Only a small percentage of the graduates move to these positions immediately after graduation. These facts would indicate that it would seem best to not put much emphasis on these subjects during the programs, but it would be wise to offer more of these subjects on a trade extension basis.

It is also apparent from many of the comments(see comments section) that many graduates think that these subjects should be tied directly to the automotive field. Instructors teaching in these areas should be aware of this need and by use of resource persons and other methods should attempt to make the subjects relate to the automotive field.

COMMENTS
For The Area of Sales And Management
Graduate Responses

"One or all of the sales and management subjects are important to any individual in everyday life."

"These courses are always useful no matter what kind of job you have."

"These courses are not very helpful to a mechanic."

"I feel the modern day auto mechanic has to be able to sell service as well as perform it."

"If you want to be any kind of a success at any business you have to know how to sell not only your business, but yourself as well."

"Instead of spending a lot of time in courses like science , sales and management, I feel more time should be spent in shop theory and the shop practical learning."

"Customer relations should be stressed in these courses."

"I think some courses may not be important directly to a mechanic, however they are all important to individual developement."

"The automotive industry in the last decade or so has had the misfortune of being judged as"cheats".

More training programs and experience will help to change this opinion of the public."

"courses were not adequate."

" I think there should be fewer of these courses taught and more emphasis placed on other areas of mechanics."

"In my job nothing is accomplished unless something is sold, so I feel these sales and management courses are essential."

METALS AND PLASTICS

Many of the subjects in this area are directly related to the automotive work that graduates perform. There are many subjects in this area that are not directly related. It is one perpose of this section to provide the reader with an assesment of how the graduates feel about the need of these subjects in relationship to their work.

Information requested: Please rate the degree of knowledge that you as an automotive mechanic feel is essential to do the type of work you are presently performing.

Metals and Plastics	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Machine shop	172	63	85	31	15	6
Welding	101	75	56	21	11	4
Forging	40	15	136	51	89	34
Foundry	27	11	131	49	107	40
Plastic molding Processes	26	10	107	40	133	50
Die-casting processes	31	12	113	43	119	45
Heat treatment	120	45	104	39	43	16
Properties of Metals	137	52	99	37	30	11

METALS AND PLASTICS (cont.)

The graduate was asked to rate the amount of use that he had for these subjects. He could check daily, weekly monthly and never. The following chart represents the choices of the graduates. The chart gives the total number answering and also the percent that number represents.

Metals and Plastics	Number	Percent
Daily	126	47
Weekly	85	31
Monthly	44	16
Never	16	6
Totals	271	100%

The areas of Forging Foundry, Plastic molding processes and Die-casting processes need to be reviewed. These areas may have some worth, but the graduates seem to feel that they are not worth a lot of time in our curriculums.

COMMENTS
For The Areas Of Metals And Plastics
Graduate Responses

"A lot of welding. Other than that they are just helpful."

"We do a lot of welding, molding of plastics and you also have to know the different properties of metals."

"A lot of welding and machine shop work."

"Lots of welding on exhaust systems and welding broken parts that can't be replaced.

"Welding and properties of metal are very important."

"I think that these courses are essential, because when you go out looking for a job and you are asked about any of these subjects your chances of getting a job is greater if you know something about them."

"You must have this knowledge in order to do alsost any big job in the shop."

"Sometimes when machinery breaks down I usually get in some welding and some use of the machines in the maintenance shop. I was thinking about going into machine shop training myself. I was taught basic welding in auto mechanics."

"The school I attended did not have half of the courses that I checked and you need them all to be a successful mechanic. There are so many problems that you don't realize about until you start the job."

"Basic knowledge of these subjects help you to understand the reasons for failure of parts and components."

"Sometimes parts are just not available and you have to improvise or at least repair old parts, so this knowledge is very helpful."

"Teach more of these rather than the sales and english."

"Welding is the most improtant, both gas and arc welding."

RELATED AUTO SUBJECTS

Related automotive subjects are those subjects that are considered part of the automotive curriculums, but are usually separated out and taught as special classes. Some of these subject areas are considered specialties by some servicing outlets, while others consider the same subject to be a normal part of all mechanics duties.

Information requested: Please rate the degree of knowledge that you as an automotive mechanic feel is essential to do the type of work you are presently performing

Related Auto Subjects	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Parts department Procedures	133	53	97	38	23	9
Used and New Car Preparation	112	44	101	40	43	16
Air-conditioning	120	45	104	40	39	15
Accessories	175	67	57	22	28	11
Fluid Power (hydraulics)	167	65	71	27	22	8
Drawing Interpretation	104	40	118	46	36	14
Auto body repair	54	21	147	58	53	21

RELATED AUTO SUBJECTS (cont)

The graduates were asked to rate the subjects of parts department procedures, used and new car preparation, air-conditioning, accessories, fluid power, drawing interpretation and auto body repair. They were asked which of these subjects they considered most important. They listed the three they considered most important. A point rating system was used to determine the degree of importance the graduates assigned to each subject. A first place rating was equal to three, a second place rating was equal to a two and a third place rating was equal to a one.

	Rating
Accessories	335
Fluid power (hydraulics)	309
Parts department procedures	277
Air-conditioning	206
Used and new car preparation	199
Drawing interpretation	184
Auto body repair	133

The subject of accessories rates very high with the graduates. This subject is one that is also mentioned as needing more attention by employers. The subject of accessories is very broad. This characteristic makes it hard for a school to develope a programs that meets the needs of all employers. This area and some of the other subjects on this page should be given some time and effort to help develop some better courses.

COMMENTS
For The Area of Related Auto Subjects
Graduate Responses

"The related auto subjects were all helpful, but not essential."

"Supposedly we had these classes when I attended."

"Air-conditioning is now in almost every vehicle and a good refrigeration man makes good money."

"I wish I knew more about accessories."

"Need more electrical trouble-shooting in school."

"I would have liked to had more air-conditioning training than I had."

"Fluid power is coming on strong in agriculture use and should be touched on in school."

" I feel these the most important because if a guy goes out for a mechanics job he is going to have to work on these so he should know something about them."

"I think that more emphasis should be put on the parts of the car that needs the most repairs."

"I feel that fluid power is most important, because I do a lot of automatic transmission work."

"Fluid power should be related more to automotive use than to a basic fluid power course."

AUTOMOTIVE SUBJECTS

Automotive subjects are naturally an important part of any automotive program. However, it is important to get the feel of how the graduate thinks these subjects are helping him in the job that he has.

Information requested: please rate the degree of knowledge that you as an automotive mechanic feel is essential to do the type of work you are presently performing.

One and two year diploma programs

Automotive Subject	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Brakes	235	87	22	8	14	5
Wheel alignment and balance	193	71	61	23	17	6
Engine Principles	240	90	13	5	14	5
Cooling systems	234	87	18	7	17	6
Standard trans. and clutches	202	77	44	17	17	6
Automatic Transmissions	174	65	72	27	21	8
Electrical Systems	239	90	14	5	24	5
Fuel systems	233	87	22	8	13	5
Rear axles	200	74	54	20	16	6

The graduates of the one and two year diploma programs were asked about their involvement in the foreign car repairs.

Question asked: Does your present job include any involvement with the foreign car market?

109 respondents or 42% of those answering said yes.

150 respondents or 58% of those answering said no.

Question asked: If you checked yes, did your program put enough emphasis on foreign car repairs?

27 respondents or 24% of those answering said yes.

84 respondents or 76% of those answering said no.

It is apparent that a substantial number of our graduates are involved in the repair of foreign cars. It is further apparent that our programs are not paying enough attention to this phase of the automotive repair market.

The graduates were asked the following questions:

> What subjects would you suggest should have been added to your program to make it of more value to your job and yourself?
>
> What subjects would you feel should be deleted from the auto mechanics program that you received?

The chart on the following page indicates the number of students suggesting that a course should be added or deleted. Only those subjects that were indicated by five or more students are recorded.

This chart represents the courses that the one and two year diploma program graduates suggested be added or deleted from their programs.

Subject	Delete	Add
Economics	7	2
Human relations	10	19
English (communications)	34	1
Psychology	6	1
Business management	3	15
Physics	14	1
Science	10	4
Mathematics	11	7
Foreign car servicing	1	6
Automatic transmissions	0	21
Machine shop	0	24
Air-conditioning	0	24
Fluid power	1	7
More hours in automechanics	0	15
Welding	0	15
Engine rebuilding	1	6
Auto body	0	14
Tune-up & carburation	0	9
Exhaust emmission controls	0	6
Parts courses	0	6

Continued

Subjects add or delete chart (cont)

Subject	Delete	Add
Marketing & advertising	3	12
Social science	5	0
Book keeping	3	7
Std. trans. & rear axles	0	10
Drafting	7	1
Front end alignment	0	8
Brakes	0	5

Because of space usage these courses were not listed by district. The statistics for a particular district are available on request.

JOB ACTIVITIES

Degree of proficiency that one and two year diploma program graduates feel is need, based on work experience.

Job activity	Proficiency is Essential		Some Proficiency Advisable		No Proficency Necessary	
	#	%	#	%	#	%
Align front axles	143	57	95	38	14	5
Balance wheels	163	65	71	29	16	6
Replace front and components	175	68	70	28	9	4
Diagnose front end problems	168	67	76	30	8	3
Tune engines	219	88	19	8	9	4
Test electrical units (starters etc)	184	73	61	24	8	3
Repair electrical units	184	73	61	24	8	3
Diagnose electrical & ignition problems	211	84	32	13	8	3
Operate a chassis dynomometer	72	30	120	49	51	21
Repair standard transmissions	148	58	94	37	12	5
Repair automatic transmissions	159	63	79	31	14	6
Repair or replace drive line parts	177	71	59	23	14	7
Diagnose transmission & drive line problems	189	76	49	20	11	4
Repair rear axle assemblies	145	60	88	36	9	4
Grind valves	173	69	57	23	19	8
Overhaul or rebuild engines	187	75	46	18	18	7
Do light body repairs	68	27	151	61	30	12
Sell merchandise	86	35	123	50	39	15
Operate the business	115	45	96	38	42	17
Do manufacturing processes	60	25	111	45	73	30
Manage a department	109	43	107	43	35	14

SELECTED ACTIVITIES

The graduates of the one and two year diploma programs were asked to rate the amount of involvement they might have with these selected activities.

Activity	Always (daily)		Frequently (weekly)		Occasionally (monthly)		Never	
	#	%	#	%	#	%	#	%
Use test equipment diagnose problems	124	50	77	31	27	11	20	8
Solve customer complaints	110	44	69	28	42	17	28	11
Sell merchandise	83	34	52	21	46	19	65	26
Act as a service writer	43	17	56	23	47	19	101	41
Prepare repair estimates	42	17	57	23	45	19	100	41
Maintain equipment	133	53	77	30	29	11	14	6
Do mechanical repairs on cars	192	74	34	13	22	9	11	4
Write a report	35	14	45	18	56	23	109	45
Work on an assembly line	7	3	8	3	10	4	223	90
Run your own business	20	9	12	5	27	12	173	74
Manage a business for someone	25	10	19	8	44	18	160	64
Work for a parts department	30	12	22	9	51	21	143	58
Do used or new car preparation	34	14	54	22	55	23	100	41
Work as a jobber salesman	13	5	14	6	26	10	195	79
Work as a service manager	25	10	25	10	40	17	154	63

ASSOCIATE DEGREE SECTION

PERSONAL DATA: Associate degree programs.

The following chart indicates the years from which the graduates responding to the survey graduated.

YEAR OF GRADUATION	Number	Percent
67	8	16.5%
68	11	23%
69	8	16.5%
70	11	23%
71	10	21%
Totals	48	100%

EMPLOYMENT DATA

Question Asked: What is your present employment status?

Status	Number	Percent
Full time	38	81%
Part time	6	13%
unemployed	3	6%
Military Service	6	13%
Totals	53	100% + 13%

The numbers and percentages do not add up to the totals indicated in the number of graduates, because some respondents checked both full time and Military.

EMPLOYMENT DATA (cont)
Associate degree

Question asked: How well does your automotive training relate to your present job?

Relationship	Number	Percent
Directly related	31	69%
Somewhat Related	11	24%
Not related	3	7%
Totals	45	100%

The statistics seem to indicate that the graduates are obtaining jobs that are related to their training.

The following chart relates to the job titles that were reported by the graduates. Job titles of an automotive nature are listed and the statistics recorded. Any job not directly related to the automotive field is listed as miscellaneous.

Title	Number	Percent
Technician or Mechanics	21	49%
Service Manager	3	7%
Parts man	2	5%
Equipment Maintenance	0	0%
Miscellaneous	17	39%
Totals	43	100%

EMPLOYMENT DATA (cont)
Associate Degree

The respondent was asked to indicate the length of time that he held each job. To get an indication of whether the graduates are getting jobs and sticking to them the statistics for the last job listed on the survey was recorded. The data is listed by a span of months and by the number and percent holding a job for that particular span.

Length in months	Number	percent
1-6	6	14%
7-12	8	19%
11-24	12	29%
25-48	16	38%
Totals	35	100%

The graduates were asked if their initial job was obtained before their graduation date. This data gives an indication of the numbers of students that are working in the automotive field while attending school. Only jobs considered automotive in nature were to be considered.

Job obtained	Number	Percent
Before Graduation	24	57%
After Graduation	18	43%

The above charts indicate that the average graduate obtains a job before graduation and tends to hold his present job 24 months or longer.

EMPLOYMENT DATA (cont)
Associate degree

Question asked: What assistance did you have in obtaining your initial job?

Catagory	Number	Percent
Friend	15	38.5%
Parent	1	2.5%
School Guidance & Placement	4	10.5%
Teacher	2	5%
Dept. head	1	2.5%
Wisconsin Employment Ser.	2	5%
Newspaper Ad.	8	20.5%
Other	6	15.5%
Totals	29	100%

It is apparent that there is no set pattern as to the the method that the graduates are obtaining their first jobs. If anything pertinent is shown it seems to be that the schools are not doing a adequate job of helping the students find employment.

Degree of job satisfaction expressed by district.
Two year associate degree programs.

Question asked: How do you like your present job?

DISTRICT NUMBER	I am very pleased	I am fairly satisfied	I am satisfied but plan to change jobs	I dislike my job, I will change jobs
	#	#	#	#
4	8	3	5	0
6	4	5	2	1
9	3	0	2	0
12	5	1	3	0

46% of the respondents indicate that they are satisfied with their present jobs while 28% indicate that they are satisfied, but plan to move on or up. 24% said that they were fairly satisfied while only 2% indicate that they will definitely change jobs.

It appears that most of the graduates from the associate degree programs are finding jobs that are to their liking and are able to advance themselves to higher paying positions more quickly than the graduates from the diploma programs.

Average monthly rates of pay for graduates at the time of job entry.

Automotive Technology programs

DISTRICT	4	6	9	12	%
Under $400	8	3	3	6	46
$400-$500	4	3	3	1	26
$500-$600	1	5			14
$600-$700	3			1	9
$700-$800					
$800-$900	1	1			5
$900-$1000					
Over $1000					

Average monthly rates of pay for graduates at the time of survey

Under $400	3	1	1	2	16
$400-$500	2	1	1	1	12
$500-$600	3	4	3	2	29
$600-$700	2	3		1	14
$700-$800	3	1		1	12
$800-$900		2		1	7
$900-$1000	2		1		7
Over $1000	1				3

The following information is the subject evaluation for the area of mathematics for automotive technology graduates associate degree programs.

Information asked for: (Please rate the degree of knowledge that you as an automotive technician feel is essential to do the type of work you are presently performing.

MATHEMATICS	Knowledge is Essential		Some Knowledge Necessary		No Knowledge necessary		No Response	
	#	%	#	%	#	%	#	%
Basic mathematics	35	76	10	22	1	2		
Algebra	15	13	17	36	15	32		
Trigonometry	6	13	16	38	25	53		
Calculus	0	0	9	20	37	80		
Slide rule use	7	15	13	28	27	57		
Graphical interp	16	34	19	41	12	25		
Vector Applications	5	11	15	32	27	57		
Fractions	28	58	13	27	7	15		
Logarithms	2	5	6	13	38	82		
Analytic Geometry	3	7	13	30	28	63		

The following information is the use rating given the subject of mathematics by graduates from the Associate degree automotive technology programs.

Information asked for: (In general how would you rate the need for mathematics in your present job?)

DISTRICT	Heavy use (daily)	Medium use (weekly)	Light use (Monthly)	Never used
	#	#	#	#
4	2	12	2	
6	7	2	2	1
9	2	1	3	
12	3	4	2	
TOTALS	14	19	9	1

SCIENCE

The following information is the subject evaluation for the area of science for the two year associate degree programs.

Information requested: Please rate the degree of knowledge that you as an automotive technician feel is essential to do the type of work you are presently performing.

General subject areas.

SCIENCE	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Chemistry	4	9	22	49	19	42
Physics	9	19.5	25	54.5	12	26
Basic Science	20	44.5	19	42	6	13.5
Specific subject areas						
Properties of liquids	13	28	26	56.5	7	15.5
Mechanics	31	67.5	13	28	2	4.5
Change of State	16	35	24	52	6	13
Heat	26	57	23	28	7	15
Light	13	29	23	51	9	20
Sound	11	24	26	56	9	19
Magnetism	23	51	17	38	5	11
AC and DC electricity	36	78	8	17.5	2	4.5
Refrigeration	20	42.5	19	40.5	8	17.0
Energy	15	33	21	47	9	20
Work Formulas	9	19.5	27	58.5	10	22
Electronic Theory	18	39	19	41	9	20

The associate degree graduates indicate by their response to the various subjects, that very little but basic science is needed as far as performance on their jobs is concerned. Upon study of the proceeding chart it is apparent that most feel that some knowledge is necessary in almost all of the subjects mentioned. The following responses to the need rating for science also indicates that these graduates feel that the present courses are adequate and should be continued.

Question asked: How would you rate the need for science courses in curriculums of auto technology programs?

Need category	Number	Percent
Present courses are adequate	28	61%
More science is needed	13	28%
Less concentration on these courses is needed	4	9%
No science beyond High School	1	2%

The main comment of the students regarding the area of science was that many instructors fail to relate the various sciences to their main field of study. Some students suggest that the science needed could be taught by an individual well versed in automechanics.

GENERAL EDUCATION

The following information is the subject evaluation for the subject areas of General Education for the associate degree programs.

Information requested: Please rate the degree of knowledge that you as an automotive technician feel is essential to do the type of work you are presently performing.

Communications Skills	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Technical report writing	16	34	18	38	13	28
Speech	20	42.5	23	49	4	8.5
General English courses	16	35	29	63	1	2
Economics	8	17	27	57.5	12	25.5
American institutions	2	4.5	23	50	21	45.5
Human relations	10	43.5	21	45.5	5	11
Industrial organization	13	28	25	53	9	19

Report writing, speech and human relations are the courses that graduates feel are the areas of greatest importance. English rates very high in the some knowledge necessary catagory. American Institutions should be analysed with the possibility of removing it from the curriculumns considered.

The graduates were asked to rate the value of the general education and communications skills courses as they related to their present jobs.

Value rating	Number	Percent
Of great value	15	33%
Of some value	24	52%
Of little value	7	15%
Of no value	0	0%

The graduates were asked to rate these subjects as a group in relationship to how they affect them in their present jobs. The reaction seems to be that the courses are of some value in 52% of the cases and in 33% of the cases were considered of great value. There is a strong indication here that these courses should not only be continued but in some cases strengthened. The only exception to this indication is American Institutions. It is apparent that the graduates did not feel this particular course worthwhile.

SALES AND MANAGEMENT

The following information is the subject evaluation for the subjects of sales and management. The respondents are from the associate degree programs.

Information requested: Please rate the degree of knowledge that you as automotive technician feel is essential to do the type of work you are presently performing.

Sales and Management	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Sales methods	16	35	19	41	11	24
Business Management	20	42.5	17	36	10	21.5
Marketing	9	19.5	20	43.5	17	37
Insurance	9	19.5	15	32.5	22	48
Finance	8	18	18	41	18	41
Government Regulations	9	19	26	55.5	12	25.5
Wholesale Selling	10	23	20	45	14	32
Retail Selling	11	25.5	18	42	14	32.5
Interview Techniques	12	26	20	43.5	14	30.5
Customer Relations	34	74	10	22	2	4
Service Management	27	59	15	33	4	8
Public Relations	27	59	18	39	1	2

METALS, MATERIALS AND PLASTICS

The metals, materials and plastics areas are studied by the associate degree graduates. At times subjects are studied as they relate to the automotive field and at times they are studied as they relate to their own particular field. The worth of these subjects for the automotive associate degree program can best be measured by how the graduates and their employers feel about the subjects worth.

Information requested: Please rate the degree of knowledge that you as an automotive technician feel is essential to do the type of work you are presently performing.

Metals Materials Plastics	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Machine shop	30	64	13	27.5	4	8.5
Welding	31	66	13	27.5	3	6.5
Forging	4	8.5	32	68	11	23.5
Foundry	4	8.5	31	64.5	13	27
Plastic molding processes	5	10	21	44	22	46
Die casting processes	5	10	29	60.5	14	29.5
Metallurgy	14	29	29	605	5	10.5
Heat treatment	17	35.5	25	52	6	12.5
Properties of Materials	27	56.5	18	37.5	3	6

METALS, MATERIALS AND PLASTICS(cont)

The graduate was asked to rate the amount of use that he had for these subjects. He could check daily, weekly, monthly and never. The following chart represents the choices of the graduates. The chart gives the total number answering and also the percent that number represents.

	Number	Percent
Daily	21	46.5%
Weekly	17	38%
Monthly	5	11%
Never	2	4.5%
Totals	45	100%

The statistics indicate, that in general, the graduates feel that these types of courses are of value to themselves and their work. Some areas such as forging, foundry, plastic molding and die casting processes are not of prime importance and should be de-emphasized.

RELATED AUTO SUBJECTS

Related auto subjects are those subjects that are considered part of the automotive curriculms, but are usually separated out and taught as special classes. The amount of knowledge that a graduate needs in these areas to do an effective job of being an automotive technician is one way that the value of these subjects to our programs can be judged.

Information requested: Please rate the degree of knowledge that you as an automotive technician feel is essential to do the type of work you are presently performing.

Related Auto Subjects	Knowledge is Essential		Some Knowledge Necessary		No Knowledge is Necessary	
	#	%	#	%	#	%
Parts Dept. Procedures	17	36	26	55.5	4	8.5
Used and New Car Preparation	14	30	22	47	11	23
Technical Drafting	6	13	26	54	16	33
Air Conditioning	22	46	19	39.5	7	14.5
Accessories	31	66	11	23.5	5	10.5
Fluid power (hydraulics)	27	56	19	40	2	4
Auto Production	12	26	25	54.5	9	19.5
Auto body repair	9	19.5	25	54.5	12	26

The above subjects are not the only ones offered in the auto technical programs of our State. The subjects were choosen to get a feel of how the graduates embrace these type of subjects. It is apparent that although they feel that some knowledge is necessary in most case, they do not feel that most of these subjects are essential to the programs.

The graduates were asked to rate the subjects of parts department procedures, used and new car preparation, technical drafting, air-conditioning, accessories, fluid power, auto production techniques and auto body repair. They were asked which of these subjects they considered most important. They listed the three they considered most important. The results are listed in the order reported most important by the graduates. A point rating system was used to determine the degree of importance the graduates assigned to each subject. A first place rating was equal to three, a second place rating was equal to a two and a third place rating was equal to a one.

	Rating
Fluid power(hydraulics)	69
Accessories	62
Air-conditioning	33
Parts department procedures	25
Technical drafting	23
Auto production techniques	18
Used and new car preparation	16
Auto body repair	15

The ratings received by fluid power and accessories make them the undeniable choice of the graduates. It would seem to indicate that the graduates prefer these two subjects to be taught in some depth and consider that most of the other subjects need only be touched on.

The graduates were asked about their involvement in the foreign car market and foreign car repairs.

Question asked: Does your present job include any involvement with the foreign car market?

23 graduates or 50% of those answering said yes.

23 graduates or 50% of those answering said No.

Question asked: If you checked yes, did your program put enough emphasis on foreign car repairs?

10 graduates or 42% of those answering said yes.

14 graduates or 58% of those answering said No.

No definite conclusions can be drawn from these answers, but it would be wise of our schools to keep abreast of the needs of organizations servicing foreign cars.

The graduates were asked the following two questions:

What subjects would you suggest should have been added to your program to make it of more value to your job and yourself?

What subjects would you feel should be deleted from the auto technology program?

The chart on the following page indicates the number of students suggesting that a course should be added or deleted. It is interesting to note that most students indicated that courses should be added (59). Only 23 times did students suggest that courses should be deleted.

The following chart represents the courses that graduates suggested should be added or deleted from their programs.

Associate Degree

SUBJECT	DELETE	ADD
Human relations	1	
English	2	
American Institutions	8	
Physics	4	3
Psychology	2	
Chemistry		1
Metallurgy		1
Strength of Materials		1
Machine Shop		3
Welding		6
Drafting		2
Diesel Engines		2
Tune up-Carburetion		6
Electrical Systems		4
Body		6
Engine Theory	1	
Mathematics	3	1
Economics	2	
Air-conditioning		3
Engine rebuilding		1
Automatic Transmissions		3
Frt. end alignment		2
Emission Controls		3
Parts		1

AUTOMOTIVE SUBJECTS

Automotive subjects are naturally an important part of any automotive program. It is, however, important to get the feel of how the graduate thinks these subjects are helping him in the jobs that he has had or has.

Information requested: Please rate the degree of knowledge that you as an automotive technician feel is essential to do the type of work you are presently performing.

Automotive Subjects	Knowledge is Essential		Some Knowledge Necessary		No Knowledge Necessary	
	#	%	#	%	#	%
Brakes and Steering	40	89	4	9	1	2
Wheel alignment and Balance	35	76	9	19.5	2	4.5
Engine Principles	42	89	4	9	1	2
Engine repair Techniques	39	87	5	11	1	2
Cooling Systems	39	87	5	11	1	2
Std. Transmission and Clutches	37	80.5	8	17.5	1	2
Automatic Transmissions	34	74	10	22	2	4
Tune up Theory	40	87	5	11	1	2
Tune up Practice	41	89.5	4	8.5	1	2
Electrical Systems	43	93.5	2	4.5	1	2
Fuel Systems	41	89	4	9	1	2
Rear Axles	38	81	8	17	1	2

JOB ACTIVITIES

Degree of proficiency that associate degree graduates feel is needed, based on work experience.

Job Activity	Proficiency is Essential		Some Proficiency Advisable		No Proficiency Necessary	
	#	%	#	%	#	%
Align front axles	25	54	16	35	5	11
Balance wheels	25	55.5	14	31	6	13.5
Replace front end components	30	64	13	28	4	8
Diagnose front end problems	35	74.5	8	17	4	8.5
Tune engines	41	87	4	8.5	2	4.5
Test electrical Units	35	74.5	7	15	5	10.5
Repair electrical units	31	66	12	25.5	4	8.5
Diagnose elect. & ignition prob.	36	78	5	11	5	11
Operate chasis dynomometer	15	32.5	23	50	8	17.5
Repair standard transmissions	25	54	16	35	5	11
Repair automatic Transmissions	23	50	15	32.5	8	17.5
Diagnose trans.& driveline prob.	32	69.5	12	26	2	4.5
Repair rear axle assemblies	26	56.5	14	30.5	6	13
Grind valves	26	59	14	30	5	11
Overhaul or rebuild engines	32	68	10	21	5	11
Diagnose engine problems	39	85	5	11	2	4
Light body repair	13	29	19	42	13	29
Service & repair emission controls	27	59	12	26	7	15
Sell merchandise	9	20	24	53.5	12	26.5
Manage a department	16	35.5	22	49	7	15.5
Deal with customers	31	67.5	9	19.5	6	13
Operate the business	17	37	18	39	11	24
Do manufacturing processes	6	12.5	21	45	20	42.5
Supervise Manufacturing	6	13	19	41	21	46

SELECTED ACTIVITIES

The graduates were asked to rate the amount of involvement they might have with these selected activities.

Associate Degree

Activity	Always (daily)		Frequently (weekly)		Occasionally (monthly)		Never	
	#	%	#	%	#	%	#	%
Work with an engineer as an assistant	5	11.5	3	7	8	18	28	63.5
Work for a manufacturer doing technical work	7	16	1	2	4	9	32	73
Use test equipment to diagnose problems	24	52.5	13	28	3	6.5	6	13
Solve customer complaints	27	58.5	12	26	3	6.5	4	9
Sell merchandise	14	32	8	18	7	16	15	34
Act as a service writer	11	24	7	15	10	22	18	39
Prepare repair estimates	11	24	4	9	9	20	21	47
Maintain equipment	16	40	11	27	9	23	4	10
Help design products	6	13	5	11	11	24	24	52
Do mechanical repairs to cars	28	63	5	11	5	11	7	15
Work as a mechanic	26	67	5	14	2	5	6	15
Write technical reports	9	20	1	2	10	22	26	56
Work on an assembly line	5	13	1	2.5	2	5	33	80
Do quality control work	8	19	4	9	7	16	24	56

(continued)

SELECTED ACTIVITIES (cont)

Activity	Always (daily)		Frequently (weekly)		Occasionally (monthly)		Never	
	#	%	#	%	#	%	#	%
Run your own Business	3	6.5	3	6.5	4	8.5	36	78.5
Manage an entire business	8	18	2	4.5	5	10.5	31	67
Act as a sales manager	5	11	1	2	5	11	35	76
Work for a parts department	4	9	5	11	8	18	27	62
Manage a parts dept.	2	5	4	9	0	0	39	86
Do drafting work	2	4.5	3	6.5	9	20	31	69
Do used or new car prep	5	11	7	15	8	18	26	56
Maintain production Machinery	6	13	3	6	8	17	30	64
Work as an inspector	6	14	2	4	3	7	33	75
Work as a jobber salesman	1	2	0	0	4	9	40	80
Work for a mfg as a service rep.	1	2.5	1	2.5	3	7	38	88
Work as an auto service Manager	3	7	4	9	5	11	32	73

COMMENTS

Mathematics:

"The ability to read and understand precision measuring instruments and being able to add and subtract decimals really is essential."

"There is no real value to an auto mechanic unless he would go on to school."

Science:

"More emphasis should be placed on electricity and electronics as they are becoming more complex and more common in todays automobile."

Communication skills:

"Being able to communicate with people and getting them to understand what they are trying to say or what you are trying to tell them is very important in my job."

"Ability to communicate with all types of people with varying backgrounds and salesmanship is a very essential part of my work."

Automotive subjects:

"All of these subjects are very essential in my work. I think the schools electrical and automatic transmission courses could have been longer."

Sales and Management:

"Being a salesman is part of my job, as is knowing how to deal with the customer as well as the men in the shop. I feel most of the sales and management courses arent really necessary, altho some of them are nice to know a little bit about."

General:

"Dear sir: The questionnaire arrived today after being forwarded. Immediately after graduation my son went into the U.S. Air Force. He felt this branch of the service would offer him opportunities in his chosen field. He has been overseas for the past 16 months, but has written often that his previous training he recieved at Oshkosh tech Institute Has been of great value."

SUMMARY AND CONCLUSIONS

RECOMMENDATIONS

SUMMARY

During the spring and summer of 1972, a survey of the automotive technology and automotive mechanics were reviewed by means of a survey. The employers of graduates from these programs were also included in the survey. The survey was handled through the cooperation of Madison Area Technical College and the Wisconsin State Board Of Vocational, Technical and Adult Education. The primary purpose of the survey was to determine if the automotive programs of our state are meeting the needs of the employers and the graduates. The one and two year diploma programs and the associate degree programs are included in the survey and the report.

The material to be surveyed was determined by inspection of present curriculums and courses, suggestions of automotive instructors, suggestions of Wisconsin State Board of Vocational, Technical and Adult Education staff members and by direct contact with employers.

It is recognized that the data collected is subject to the limitations of the of the data received and the limitations of the size of the sample. In no way can the results be considered absolutley accurate. Some of the varibles involved would be that many of those not responding to the survey are undoubtedly in the group of people who have not had success through training in any of the automotive programs. The findings are further limited by the reluctance of some respondents to answer various questions.

With the above limitations in mind, the following includes a brief summary of the resulting conclusions and recommendations. These conclusions and recommendations are from all sections of the survey study.

SUMMARY OF THE FINDINGS

1. The employers and graduates surveyed were quite evenly spread throughout the State. The number graduates surveyed was substantial. The number of employers surveyed left something to be desired. Out of State employers was not a major consideration.

2. The size of the employers varied with one employer having over 1,000 employees to businesses having only 1 employee. The average employer employed 22 persons. The true average is something less than 22 do to the fact that some companies seemed to have indicated all their employees, not just mechanics as asked for.

3. The types of business employing the graduates varied to the point that the only conclusion that can be drawn is that a business that employes auto mechanics graduates can be just about any business that transports their own products or any business that is involved with the sale or service of autos.

4. The jobs that most of the graduates perform are directly related to their training they have received. Most graduates feel that their programs were of great value to them in their jobs.

5. Generally speaking, the employers of the graduates were satisfied with the type of training of the people they are getting from our programs. Their main criticism is usually that the graduate lacks some specific skill or that the graduate wants to become more deeply involved in some repair areas than the employer feels he is capable of.

6. Many of the graduates feel that more hours of training is needed for the general areas of their automotive training and also for some of the specialty areas such as accessories, hydraulics and air-conditioning.

7. The greatest concern of the graduates, as it relates to the specific course, is that these courses should be somehow directly related to the areas of automechanics. This need is heard throughout the report and is not restricted to any one program or district.

8. The average automechanic program graduate tends to hold his job for twenty four months or more. In most cases he indicates that he likes his job. In many cases he plans to move up in the organization he is in or move on to another job.

9. On of the biggest problems identified by this survey is that the graduates are getting sub-standard wages when they are able to find the job that they want. In some cases the starting wage is below two dollars per hour. Many graduates that change jobs are doing so because of the low wages they are receiving. The average graduate starts working for below four hundred dollars per month and at the time of the survey the average graduate was only making four to five hundred dollars per month. It is amazing that we are able to attract anyone into this highly complex trade.

10. The subjects that both employers and employees feel are essential for employment are all of the major automotive subjects, plus a strong desire on both parties part to have good training and background in human and public relations. The subjects that received strong ratings can be reviewed by going to the charts in the employer and employee sections of the report.

11. The job activity most often incicated was doing mechanical repairs on cars. Other areas of job activities were sales, maintaining equipment, use of test equipment and solving customer complaints. The knowledge necessary to perform many of the activities listed does not come from training programs, but instead comes from experience.

12. The small number of graduates being placed by schools is an indication that the liaison between the schools and the businesses doing the employing is very weak. Most graduates found their own jobs. No plan to place graduates could be identified.

CONCLUSIONS AND RECOMMENDATIONS.

Most of the conclusions and recommendations can be found along with the various charts and grafts. It was felt that these statements would mean more at these locations than in a lengthy summary. A short summary follows.

1. It is recommended that better communications and placement programs be developed between industry and our automotive training programs.

2. It is concluded that wages of the graduates is toolow to attract the qualified men we need in this industry. It is recommended that our programs help promote items that will help wage rates and better working conditions for the graduates. This could be in the form of licensing programs etc.

3. It is recommended that a strong emphasis be made to make the related subjects, such as, English, mathematics and science become more related to the automotive subjects that the students are studying.

4. Because employers demand experience of the graduates, methods of finding part-time employment for the students should be investigated.

5. The number of hours of actual automotive training for these programs should be reviewed. An attempt to have people teaching subjects such as related science work with automotive instructors to avoid repeating of material should be attempted.

6. It is the general conclusion that the programs of automotive training programs of our State are doing the job for which they were intended. The employers are fairly satisfied and so are the graduates. This is not reason to assume we do not need improving. It should be our aim to be constantly on the lookout to find ways to improve.

APPENDIX

APPENDIX A

I am willing to participate in a personal interview. _____

I am unable to participate in a personal interview but will respond to the questionnaire and return it by May 10th. _____

I am unable to respond to the questionnaire by May 10th. _____

If you agree to an interview, please check dates which you believe you will be available for the interview:

Day of week: Mon ___ Tues ___ Wed ___ Thur ___ Fri ___ Sat ___

Approximate time of day: ______________________________

Place and address of interview: ______________________________

____

Since I would like to telephone you to arrange a specific time for the interview, would you provide the following information:

Your name: ______________________________

Business address: ______________________________

City: ______________________________

Business telephone number: ______________________________

Home telephone number: ______________________________

THANK YOU FOR YOUR IMMEDIATE RESPONSE.

State of Wisconsin \ BOARD OF VOCATIONAL, TECHNICAL & ADULT EDUCATION

EUGENE I. LEHRMANN
State Director
137 EAST WILSON STREET
MADISON, WISCONSIN 53703

APPENDIX B

To: Employers of Automotive Graduates

Our office is conducting a comprehensive study of the automotive programs in the Wisconsin Vocational, Technical and Adult Education system.

We are pleased that you have employed graduates from one of our vocational-technical schools.

Because our schools are interested in providing employers with highly qualified graduates, we are asking you to help us evaluate our automotive curriculums.

Would you please take time from your busy schedule to complete the enclosed questionnaire and return it in the enclosed self-addressed envelope to Mr. Melvin Seamens by May 10, 1972. All the information you furnish will be treated confidentially.

Thank you for your cooperation.

Sincerely,

Eugene Lehrmann

Eugene Lehrmann
State Director

db

Enc.

MADISON AREA TECHNICAL COLLEGE
211 NORTH CARROLL, MADISON, WISCONSIN 53703 · 608 257-6711

NORMAN P. MITBY
District Director

April 25, 1972

APPENDIX C

Enclosed is a survey questionnaire relating to a study of Automotive Mechanics or Automotive Technicians curriculums of the various Vocational and Technical schools throughout the State of Wisconsin.

This study is being performed for the Wisconsin Board of Vocational, Technical and Adult Education and they will attempt to use this information to upgrade the various Automotive programs in the State.

The questionnaire takes between 15 to 30 minutes to complete and I hope you can find time in your schedule to complete it promptly and return it to me in the self-addressed and stamped envelope enclosed.

The people being surveyed include all Auto Mechanics and all Auto Technology graduates for the years 1967-1971. We think that your training and work experience make you the best qualified people to judge the curriculums of our schools.

Sincerely,

Melvin Seamans

Melvin Seamans, Coordinator
Auto Technology Program

MS:bs
encl

AREA BOARD OF VOCATIONAL, TECHNICAL AND ADULT EDUCATION DISTRICT NO. 4
Marvin E. Brickson, Chairman Dr. Ray Rueckert, Vice Chairman George Hall, Secretary John F. Misfeldt, Treasurer
Walter Brink Francis E. Kohn Robert Utley

APPENDIX D

AUTOMOTIVE MECHANICS' EMPLOYERS SURVEY

EMPLOYER DATA

Name of Business: ____

Address: ____
Street City State

Name of Person Responding to Questionnaire:

____
Last First Middle

Position Title: ____

Number of Automotive Mechanics Employed: ________________________

What percent of your automotive mechanics are employed on half-time or less basis? ____

Approximately what percent of your automotive mechanics are employed directly from the vocational schools? __________________

By what means did you initially communicate with the automotive mechanic employees who came directly from the vocational schools?

____

____

____

What is the monthly rate of pay for your new automotive mechanics coming directly from the vocational schools? ____________________

SUBJECT MATTER EVALUATION

In the remainder of this survey we are asking you to rate the value of various subjects and activities. Rate them as to what knowledge and skills you think a new apprentice automotive mechanics employee should have after graduating from a vocational school in the field of auto mechanics. We welcome comments at the end of each section to help us evaluate the subjects.

MATHEMATICS	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Basic mathematics	____	____	____
Formulas	____	____	____
Fractions and decimals	____	____	____
Systems of measuring angles	____	____	____
Horsepower calculations	____	____	____
Shop geometry and layout	____	____	____
Graphs and charts related to auto	____	____	____
Business math	____	____	____
Calculate areas and volumes	____	____	____
Payroll calculations	____	____	____
Repair order breakdowns	____	____	____
Parts make-up	____	____	____
Bookkeeping and accounting	____	____	____
Algebra	____	____	____
Powers and roots	____	____	____
Job estimates	____	____	____
Inventory control	____	____	____
Ordering parts and supplies	____	____	____
Income Tax	____	____	____
Percentages	____	____	____
Ratios	____	____	____
Bills and billing	____	____	____
Wages and wage plans	____	____	____

In general, how would you rate the need for mathematics for the automotive mechanics?

Heavy use (daily) ____ Medium use (weekly) ____ Light use (monthly) ____ Never used ____

Comments:

MECHANICAL DRAWING	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Blueprint reading	____	____	____
Shop sketches	____	____	____
Drafting instruments	____	____	____
Use of automotive symbols	____	____	____

In general, how would you rate the need for mechanical drawing for the automotive mechanics?

Heavy use (daily) ____ Medium use (weekly) ____ Light use (monthly) ____ Never used ____

Comments:

SCIENCE

General Subject Areas			
Basic Chemistry	____	____	____
Basic Physics	____	____	____
Basic Science	____	____	____
Specific Subject Areas			
Properties of liquids	____	____	____
Change of state	____	____	____
Heat	____	____	____
Light	____	____	____
Sound	____	____	____
Magnetism	____	____	____
AC and DC electricity	____	____	____
Refrigeration	____	____	____
Work and energy formulas	____	____	____
Electronic theory (beyond basic electricity)	____	____	____
Basic fluids and laws	____	____	____
Gases, paints, lacquers, etc.	____	____	____
Plastic, glass, fabrics, etc.	____	____	____
Salts, acids, and bases	____	____	____
Batteries	____	____	____
Symbols and equations	____	____	____
Basic electricity	____	____	____

In general, how would you rate the need for science for the automotive mechanic?

Need more science ____ Present knowledge is sufficient ____
Little to No science is needed ____

Comments:

GENERAL EDUCATION	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
General English courses	_____	_____	_____
Speech	_____	_____	_____
Report writing	_____	_____	_____
Economics	_____	_____	_____
Human Relations	_____	_____	_____
Reading and understanding technical data	_____	_____	_____

Please rate the value of general education courses as they relate to the automotive mechanic doing his job.

Of great value _____ Of some value _____ Of little value _____
No value _____

Comments:

SALES AND MANAGEMENT	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Sales methods	_____	_____	_____
Business management	_____	_____	_____
Marketing	_____	_____	_____
Insurance	_____	_____	_____
Finance	_____	_____	_____
Retail selling	_____	_____	_____
Customer relations	_____	_____	_____
Public relations	_____	_____	_____
Shop management	_____	_____	_____
Government regulations	_____	_____	_____
Interview techniques	_____	_____	_____
Wholesale selling	_____	_____	_____
Service writing	_____	_____	_____
Customer relations	_____	_____	_____
Service management	_____	_____	_____
Public relations	_____	_____	_____
Operate the business	_____	_____	_____
Service sales	_____	_____	_____
Factory service	_____	_____	_____

In general, would you like to see more of these types of courses taught or would you rather see them taught less in the schools for the automotive mechanics?

More _____ Less _____

Comments:

METALS AND PLASTICS	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Machine shop	_____	_____	_____
Gas welding	_____	_____	_____
Arc welding	_____	_____	_____
Welding aluminum	_____	_____	_____
Brazing	_____	_____	_____
Cutting metal with gas	_____	_____	_____
Forging	_____	_____	_____
Plastic molding processes	_____	_____	_____
Die-casting	_____	_____	_____
Heat treatment	_____	_____	_____
Properties of metals	_____	_____	_____

In general, the automotive mechanics use the above

Daily _____ Weekly _____ Monthly _____ Never _____

Comments:

RELATED AUTO SUBJECTS			
How to obtain technical information & specifications	_____	_____	_____
Use of trade manuals	_____	_____	_____
Union and Labor organization	_____	_____	_____
Apprenticeship and journeymen	_____	_____	_____
Retirement and insurance	_____	_____	_____
Dealership organization	_____	_____	_____
Further schooling for advancement	_____	_____	_____
Parts department procedures	_____	_____	_____
Used and new car preparation	_____	_____	_____
Auto production techniques	_____	_____	_____
Sell merchandise	_____	_____	_____
Auto body repair	_____	_____	_____
Accessories	_____	_____	_____
Air conditioning	_____	_____	_____
Light body repair	_____	_____	_____

In general, how do you consider the above for the automotive mechanic in this present position or in an advance position?

Major importance ____ Minor importance ____ Of no importance ____

Comments:

AUTOMOTIVE SUBJECTS	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Brakes			
Theory of brakes and friction			
Brake construction			
Self energization			
Hand brakes			
Power brakes			
Adjustment of brakes			
Flushing and bleeding			
Brake relining			
Drum and shoe grinding and fitting			
Cylinder overhaul and repair			
Disc brakes			
Chassis and Ride Control Theory			
Springs			
Shock absorbers			
Wheel alignment theory			
Wheel alignment visual inspection			
Wheel alignment road test			
Wheel alignment service			
Lubrication			
Fluid system			
Lubrication inspection and service			
Rear independent suspension system			
Wheel balancing theory			
Balancing wheels (static and dynamic)			
Diagnosis of suspension problems			
Tire tread and wear			
Plies and tire size			
Radial tire design			
Tire care			
Tire service			
Tire construction			
Tire rotation			
Differentials theory			
Rear axle theory			
Description of axle types			
Wheels			
Drive lines			
Leaf springs			
Front end suspension system			
Clutches			
Standard transmissions			

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Engine Principles of Operation	___	___	___
Component parts	___	___	___
Tolerances of components	___	___	___
Theory of internal combustion	___	___	___
Detonation	___	___	___
Preignition	___	___	___
Engine efficiencies	___	___	___
Trouble shooting engine troubles	___	___	___
Lubrication system theory	___	___	___
Cooling System Theory	___	___	___
Heat exchangers	___	___	___
Heat transfer	___	___	___
Troubleshooting	___	___	___
Repair and service	___	___	___
Automatic Transmission Theory	___	___	___
Basic principles of operation	___	___	___
Torque specifications	___	___	___
Torque converters	___	___	___
Hydraulic systems	___	___	___
Transmission gearing	___	___	___
Removal of major units	___	___	___
Power flow at various shift positions	___	___	___
Adjustments	___	___	___
Be familiar with several manufacturing types (Ford, GM, etc.)	___	___	___
Tune-Up Theory, Practice, and Procedure	___	___	___
Theory of Basic Electricity	___	___	___
Electrical Systems	___	___	___
Standard ignition	___	___	___
Transistorized ignition systems	___	___	___
Timing advance mechanism	___	___	___
Starter (GM, Chrysler, Ford)	___	___	___
Alternator charging systems (Ford, Chrysler, GM, etc.)	___	___	___
Generator charging systems (Ford, Chrysler, GM, etc.)	___	___	___
In-depth theory in the above electrical systems	___	___	___
Trouble shooting the electrical systems	___	___	___
Servicing the electrical systems	___	___	___

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Fuel Systems	____	____	____
Theory on fuels and carburetion	____	____	____
Combustion process	____	____	____
Additives	____	____	____
Fuel feed systems	____	____	____
Component parts	____	____	____
Pressure and temperatures	____	____	____
Principles of carburetion	____	____	____
Carburetion accessories	____	____	____
Types of carburetors	____	____	____
Fuel injection	____	____	____
Purpose of supercharging	____	____	____
Effects of altitude	____	____	____
Trouble shooting the fuel system	____	____	____
Servicing the fuel systems	____	____	____
Theory of emission control systems	____	____	____
Electrical control of the emission systems	____	____	____
Principles of operation of the various makes of emission control systems	____	____	____

How would you rate the subject knowledge and skills of employees who come from the vocational schools?

	Strong	Moderate	Weak
Brakes	____	____	____
Chassis and Ride Control Theory	____	____	____
Engine Principles of Operation	____	____	____
Cooling Systems	____	____	____
Automatic Transmission	____	____	____
Theory of Basic Electricity	____	____	____
Electrical Systems	____	____	____
Tune-Up Theory, Practice, and Procedure	____	____	____
Fuel Systems	____	____	____

Does your place of business include involvement with the foreign car market?

Yes ____ No ____

If yes, do your mechanics have sufficient background to do foreign car repairs?

Yes ____ No ____

JOB ACTIVITIES (Cont.)

	Proficiency is Essential	Some Proficiency is Advisable	No Proficiency is Necessary
Operate engine overhaul machines	____	____	____
Others (please specify)			
____________________	____	____	____
____________________	____	____	____
____________________	____	____	____

SELECTED ACTIVITIES

Listed below are a number of activities which the automotive mechanic might be involved in over a period of time. Please check the amount of involvement you believe the average mechanic experiences in the activities listed.

	Always (daily)	Frequently (weekly)	Occasionally (monthly)	Never
Use test equipment to diagnose problems	____	____	____	____
Solve customer complaints	____	____	____	____
Sell merchandise	____	____	____	____
Act as a service writer	____	____	____	____
Prepare repair estimates	____	____	____	____
Maintain equipment	____	____	____	____
Do mechanical repairs to cars	____	____	____	____
Write technical reports	____	____	____	____
Work on an assembly line	____	____	____	____
Run your own business	____	____	____	____
Manage a business for someone	____	____	____	____
Work for a parts department	____	____	____	____
Do used or new car prep	____	____	____	____
Maintain production machinery	____	____	____	____
Work as a jobber salesman	____	____	____	____
Work as an auto service manager	____	____	____	____
Other (please specify)				
____________________	____	____	____	____
____________________	____	____	____	____
____________________	____	____	____	____

What subjects would you consider need emphasizing in the vocational/technical schools in order that the employees, who come from these schools, would be of more value to you and their job responsibilities?

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

5. ______________________________

JOB ACTIVITIES

Based on knowledge and work experience with the automotive mechanics, please rate the degree of proficiency you feel the apprentice automotive mechanic needs to do a good job as a mechanic fresh out of school.

	Proficiency is Essential	Some Proficiency is Advisable	No Proficiency is Necessary
Align front axles	____	____	____
Balance wheels	____	____	____
Replace front end components	____	____	____
Diagnose front end problems	____	____	____
Tune engines	____	____	____
Test electrical units (generators, etc.)	____	____	____
Repair electrical units	____	____	____
Use test equipment to diagnose electrical and ignition problems	____	____	____
Operate chassis dynomometer	____	____	____
Repair standard transmissions	____	____	____
Repair automatic transmissions	____	____	____
Diagnose transmission and driveline problems	____	____	____
Repair rear axle assemblies	____	____	____
Grind valves	____	____	____
Overhaul or rebuild engines	____	____	____
Light body repairs	____	____	____
Sell merchandise	____	____	____
Manage a department	____	____	____
Operate the business	____	____	____
Do manufacturing processes	____	____	____
Repair or replace driveline parts	____	____	____
Brake drum turning	____	____	____
Carburetor overhaul	____	____	____

APPENDIX E

AUTOMOTIVE TECHNOLOGY SURVEY

PERSONAL DATA

NAME ______________________________ DATE OF GRADUATION __________
Last First Middle Initial

ADDRESS: ______________________________
(Where we can reach you) Street City State

EMPLOYMENT DATA

What is your present employment status?

Full Time ________ Part Time ________ Military Service ________ Unemployed ________

If you checked Full-time, Part-time, or Military Service, How well does your automotive training relate to your present job?

Directly related ________ Somewhat related ________ Not related ________

What jobs have you held since graduation?
(List all jobs after graduation to present)

Where employed	Job Title (mechanic, technician, etc)	Length of job (in months)

Was your initial automotive job obtained before your graduation date? Yes ______ No ______

What assistance did you have in obtaining your initial job? (who or what)

Friend ______ Parent ______ School guidance and placement ________

Teacher ______ Dept. head ________ Wisconsin Employment Service ________

Newspaper Ad ________ Other ______________________________

What was your monthly rate of pay when you were initially employed? (your first job)
(check correct amount)

under $400______ $400-$500______ $500-$600______ $600-$700______

$700-$800______ $800-$900______ $900-$1000______ over $1000

What is your present monthly rate of pay?

under $400______ $400-$500______ $500-$600______ $600-$700______

$700-$800______ $800-$900______ $900-$1000______ over $1000______

What is your exact job title and duties?______________________________________
______________________________________ Use other side if necessary.

How do you like your present job?

I am very pleased______, I am fairly satisfied______, I am satisfied, but plan to move up or change type of work______, I dislike my job, will definitely change jobs______.

SUBJECT MATTER EVALUATION:

In the remainder of this survey we are asking you to respond to various questions dealing with the importance of certain subjects and activities that you as an employee in the automotive field experience. We are asking you to rate your degree of involvement in these areas, so that we may find the extent that our schools should teach these subjects. At the end of some of the catagories there is a place to comment. We would like your comments to help evaluate the worth of the subject areas.

Please rate the degree of knowledge that you as an automotive technician feel is essential to do the type of work you are presently performing.

MATHEMATICS	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Basic mathematics	( )	( )	( )
Algebra	( )	( )	( )
Trigonometry	( )	( )	( )
Calculus	( )	( )	( )
Slide rule use	( )	( )	( )
Graphical interpretations	( )	( )	( )
Vector applications	( )	( )	( )
Fractions	( )	( )	( )
Logarithms	( )	( )	( )
Analytic geometry	( )	( )	( )

In general, how would you rate the need for mathematics in your present job?

Heavy use______ (Daily) Medium use______ (Weekly) Light use______ (Monthly) Never used______

COMMENTS:

SCIENCE:	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
GENERAL SUBJECT AREAS			
Chemistry	( )	( )	( )
Physics	( )	( )	( )
Basic Science	( )	( )	( )
SPECIFIC SUBJECT AREAS			
Properties of liquids	( )	( )	( )
Mechanics (pulleys-levers-etc.-	( )	( )	( )
Change of State	( )	( )	( )
Heat	( )	( )	( )
Light	( )	( )	( )
Sound	( )	( )	( )
Magnetism	( )	( )	( )
AC and DC (electricity)	( )	( )	( )
Refrigeration	( )	( )	( )
Energy	( )	( )	( )
Work Formulas	( )	( )	( )
Electronic Theory	( )	( )	( )

In general, How would you rate the need for science courses in curriculums of Auto Technology programs. (please check one)

Present courses are adequate________ More science is needed______ Less concentration on these courses is needed________ No science beyond High School___________

COMMENTS:

COMMUNICATIONS SKILLS (oral and written) GENERAL EDUCATION	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Technical report writing	( )	( )	( )
Speech	( )	( )	( )
General English courses	( )	( )	( )
Economics	( )	( )	( )
American Institutions	( )	( )	( )
Human Relations	( )	( )	( )
Industrial Organization	( )	( )	( )

Please rate the value of the general education courses as they relate to your present job.

Of great value________ Of some value_______ Of little value_____ No value______

COMMENTS:

SALES AND MANAGEMENT

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Sales Methods	☐	☐	☐
Business Management	☐	☐	☐
Marketing	☐	☐	☐
Insurance	☐	☐	☐
Finance	☐	☐	☐
Government regulations	☐	☐	☐
Wholesale Selling	☐	☐	☐
Retail Selling	☐	☐	☐
Interview techniques	☐	☐	☐
Customer Relations	☐	☐	☐
Service Management	☐	☐	☐
Public Relations	☐	☐	☐

In general, would you like to see more of these type of courses taught or would you rather see them taught less?

More________ Less________ Same__________

Comments:

METALS, MATERIALS AND PLASTICS

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Machine shop	☐	☐	☐
Welding	☐	☐	☐
Forging	☐	☐	☐
Foundry	☐	☐	☐
Plastic molding processes	☐	☐	☐
Die casting processes	☐	☐	☐
Metallurgy	☐	☐	☐
Heat treatment	☐	☐	☐
Properties of Materials	☐	☐	☐

How much use do you have for the processes taught in these programs?

Daily_______ Weekly________ Monthly________ Never__________

Comments:

RELATED AUTO SUBJECTS

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Parts Department procedures ---	( )	( )	( )
Used and New car preparation --	( )	( )	( )
Technical drafting ------------	( )	( )	( )
Air-conditioning --------------	( )	( )	( )
Accessories ------------------	( )	( )	( )
Fluid Power (hydraulics) -------	( )	( )	( )
Auto production techniques -----	( )	( )	( )
Auto body repair -------------	( )	( )	( )

Please rate in order of importance the three that you consider most important. Write your responses in the blanks below.

1. ______________________________

2. ______________________________

3. ______________________________

Comments:

AUTOMOTIVE SUBJECTS

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Brakes and steering ----------	( )	( )	( )
Wheel alignment and balance ---	( )	( )	( )
Engine principles -------------	( )	( )	( )
Engine repair techniques ------	( )	( )	( )
Cooling systems --------------	( )	( )	( )
Standard transmissions and clutches ------	( )	( )	( )
Automatic Transmissions ------	( )	( )	( )
Tune up theory --------------	( )	( )	( )
Tune up practice -------------	( )	( )	( )
Electrical systems ------------	( )	( )	( )
Fuel Systems ----------------	( )	( )	( )
Rear axles ------------------	( )	( )	( )

If you had a special problems option in your studies, how would you rate its value?

Good______________ Fair____________ Bad_____________

Comments;

Does your present job include any involvement with the foreign car market?

Yes______________ No______________

If you checked yes, did your program put enough emphasis on foreign car repairs?

Yes______________ No______________

What subjects would you suggest should have been added to your program to make it of more value to your job and yourself?

1. ____

2. ____

3. ____

What subjects would you feel should be deleted from the auto technology program.

1. ____

2. ____

3. ____

JOB ACTIVITIES

Based on your work experience, please rate the degree of proficiency you feel you need for each activity listed.

	Proficiency is Essential	Some Proficiency is Advisable	No Proficiency is Necessary
Align front axles	( )	( )	( )
Balance wheels	( )	( )	( )
Replace front end components	( )	( )	( )
Diagnose front end problems	( )	( )	( )
Tune engines	( )	( )	( )
Test electrical units (generators)	( )	( )	( )
Repair electrical units	( )	( )	( )
Use equipment to diagnose electrical and ingntion problems	( )	( )	( )
Operate chasis dynomometer	( )	( )	( )
Repair standard transmissions	( )	( )	( )
Repair automatic transmissions	( )	( )	( )
Diagnose transmission and driveline problems	( )	( )	( )
Repair rear axle assemblies	( )	( )	( )
Grind valves	( )	( )	( )
Overhaul or rebuild engines	( )	( )	( )
Diagnose engine problems	( )	( )	( )
Light body repairs	( )	( )	( )

JOB ACTIVITIES: (CONT)

	Proficiency is essential	Some proficiency is advisable	No proficiency is necessary
Service and repair emission controls	( )	( )	( )
Sell merchandise	( )	( )	( )
Manage a department	( )	( )	( )
Deal with customers	( )	( )	( )
Operate the business	( )	( )	( )
Do manufacturing processes	( )	( )	( )
Supervise manufacturing proc.	( )	( )	( )

SELECTED ACTIVITIES:

Listed below are a number of selected activities which you might be involved with during a normal work day. Please check the amount of involvement you have in the activities listed.

	Always (daily)	Frequently (weekly)	Occasionally (monthly)	Never
Work with an engineer as an assistant	( )	( )	( )	( )
Work for a manufacture doing technical work	( )	( )	( )	( )
Use test equipment to diagnose problems	( )	( )	( )	( )
Solve customer complaints	( )	( )	( )	( )
Sell merchandise	( )	( )	( )	( )
Act as a service writer	( )	( )	( )	( )
Prepare repair estimates	( )	( )	( )	( )
Maintain equipment	( )	( )	( )	( )
Help design products	( )	( )	( )	( )
Do mechanical repairs to cars	( )	( )	( )	( )
Work as a mechanic	( )	( )	( )	( )
Write technical reports	( )	( )	( )	( )
Work on an assembly line	( )	( )	( )	( )
Do quality control work	( )	( )	( )	( )
Run your own business	( )	( )	( )	( )
Manage an entire business for someone	( )	( )	( )	( )
Act as a sales manager	( )	( )	( )	( )
Work for a parts department	( )	( )	( )	( )
Manage a parts dept	( )	( )	( )	( )
Do drafting work	( )	( )	( )	( )
Do used or new car prep	( )	( )	( )	( )
Maintain production machinery	( )	( )	( )	( )
Work as an inspector	( )	( )	( )	( )
Work as a jobber salesman	( )	( )	( )	( )
Work for a mfg. as a service representative	( )	( )	( )	( )
Work as an auto Service Manager	( )	( )	( )	( )
Other: (please specify)	( )	( )	( )	( )
1. ______________________	( )	( )	( )	( )
2. ______________________	( )	( )	( )	( )
3. ______________________	( )	( )	( )	( )

APPENDIX F

AUTOMOTIVE MECHANICS SURVEY

PERSONAL DATA

Name:________________________________ Date of Graduation____________
Last First Middle Initial

Address:____
(Where we can reach you) Street City State

EMPLOYMENT DATA

What is your present employment status?

Full Time_____ Part Time_______ Military Service________Unemployed________

If you checked Full-time, Part-time, or Military Service, How well does your automotive training relate to your present job?

Directly related________ Somewhat related_________ Not related_________

What jobs have you held since graduation?
(List all jobs after graduation to present)

Where employed	Job title (mechanic, technician, etc.)	Length of job (in months)

Was your initial automotive job obtained before your graduation date? Yes_______ No______

What assistance did you have in obtaining your initial job? (who or what)

Friend_______ Parent_______ School guidance and placement________

Teacher_______ Dept. head_______ Wisconsin Employment Service________

Newspaper Ad_______ Other________________________________

What was your monthly rate of pay when you were initially employed? (first job)
(check correct amount)

Under $400______ $400-$500______ $500-$600______ $600-$700________

$700-$800______ $800-$900______ $900-$1000______ Over $1000________

What is your present monthly rate of pay?

Under $400______ $400-$500______ $500-$600______ $600-$700________

$700-$800______ $800-$900______ $900-$1000______ Over $1000________

How do you like your present job?

I am very pleased______, I am fairly satisfied_______, I am satisfied, but plan to move up or change type of work______, I dislike my job, will definitely change jobs_______.

SUBJECT MATTER EVALUATION

In the remainder of this survey we are asking you to rate the value of various subjects and activities. Rate them as to the value they have for your job. At the end of some of the areas there is a place to comment. We would like your comments to help us evaluate these subjects.

Please rate the amount of knowledge that you as an automotive mechanic feel is essential to do the type of work you are presently performing.

MATHEMATICS	Knowledge is Essential	Some Knowledge Necessary	No Knowledge Necessary
Basic mathematics ----------------	( )	( )	( )
Algebra -------------------------	( )	( )	( )
Slide rule use --------------------	( )	( )	( )
Fractions -----------------------	( )	( )	( )
Powers and roots------------------	( )	( )	( )

In general how would you rate the need for mathematics in your present job?

Heavy use______ (daily) Medium use______ (weekly) Light use_____ (monthly) Never used_____

COMMENTS:

	is Essential	Knowledge Necessary	is Necessary
General Subject Areas			
Chemistry	( )	( )	( )
Physics	( )	( )	( )
Basic Science	( )	( )	( )
Specific Subject Areas			
Properties of liquids	( )	( )	( )
Change of state	( )	( )	( )
Heat	( )	( )	( )
Light	( )	( )	( )
Sound	( )	( )	( )
Magnetism	( )	( )	( )
AC and DC electricity	( )	( )	( )
Refrigeration	( )	( )	( )
Work and energy formulas	( )	( )	( )
Electronic Theory	( )	( )	( )

In general, how would you rate the need for science courses in the auto mechanics programs. (please check one)

Present courses are adequate______ More science is needed_____ Less Science is needed_______ No science beyond High School_______

COMMENTS:

GENERAL EDUCATION

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
General English courses	( )	( )	( )
Speech	( )	( )	( )
Report writing	( )	( )	( )
Economics	( )	( )	( )
Human Relations	( )	( )	( )

Please rate the value of general education courses as they relate to your present job.

Of great value_____ Of some value______ Of little value_____ No value______

COMMENTS:

SALES AND MANAGEMENT

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Sales methods	( )	( )	( )
Business management	( )	( )	( )
Marketing	( )	( )	( )
Insurance	( )	( )	( )
Finance	( )	( )	( )
Retail selling	( )	( )	( )
Customer relations	( )	( )	( )
Public relations	( )	( )	( )

In general, would you like to see more of these type of courses taught or would you rather see them taught less?

More__________ Less__________

COMMENTS:

METALS AND PLASTICS

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Machine shop	( )	( )	( )
Welding	( )	( )	( )
Forging	( )	( )	( )
Foundry	( )	( )	( )
Plastic molding processes	( )	( )	( )
Die-casting processes	( )	( )	( )
Heat treatment	( )	( )	( )
Properties of metals	( )	( )	( )

How much use do you have for the processes taught in these programs?

Daily________ Weekly__________ Monthly________ Never__________

COMMENTS:

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Parts department procedures	( )	( )	( )
Used and New car preparation	( )	( )	( )
Air-conditioning	( )	( )	( )
Accessories	( )	( )	( )
Fluid power (hydraulics)	( )	( )	( )
Drawing interpretation	( )	( )	( )
Auto body repair	( )	( )	( )

Please rate in order of importance the three that you consider most important.

1. ____________________
2. ____________________
3. ____________________

COMMENTS:

AUTOMOTIVE SUBJECTS

	Knowledge is Essential	Some Knowledge Necessary	No Knowledge is Necessary
Brakes	( )	( )	( )
Wheel alignment and balance	( )	( )	( )
Engine principles	( )	( )	( )
Cooling systems	( )	( )	( )
Standard transmissions and clutches	( )	( )	( )
Automatic transmissions	( )	( )	( )
Tune up theory and practice	( )	( )	( )
Electrical systems	( )	( )	( )
Fuel systems	( )	( )	( )
Rear axles	( )	( )	( )

Does your present job include any involvement with the foreign car market?

Yes__________ No______________

If you checked yes, did your program put enough emphasis on foreign car repairs?

Yes__________ No______________

What subjects would you suggest should have been added to your program to make it of more value to your job and yourself?

1. ______________________________

2. ______________________________

3. ______________________________

What subjects would you feel should be deleted from the auto mechanics program that you received?

1. ______________________________

2. ______________________________

3. ______________________________

JOB ACTIVITIES

Based on your work experience, please rate the degree of proficiency you feel you need for each activity listed.

	Proficiency is Essential	Some Proficiency is Advisable	No Proficiency is Necessary
Align front axles -------------------	( )	( )	( )
Balance wheels ---------------------	( )	( )	( )
Replace front end components ---------	( )	( )	( )
Diagnose front end problems ----------	( )	( )	( )
Tune engines -----------------------	( )	( )	( )
Test electrical units (starters etc) ----	( )	( )	( )
Repair electrical units --------------	( )	( )	( )
Use test equipment to diagnose electrical and ignition problems ------	( )	( )	( )
Operate a chassis dynomometer ------	( )	( )	( )
Repair standard transmissions -------	( )	( )	( )
Repair automatic transmissions ------	( )	( )	( )
Repair or replace drive line parts ---	( )	( )	( )
Diagnose transmission & driveline problems ------------------------	( )	( )	( )
Repair rear axle assemblies ---------	( )	( )	( )
Grind valves ----------------------	( )	( )	( )
Overhaul or rebuild engines ---------	( )	( )	( )
Do light body repairs ---------------	( )	( )	( )
Sell merchandise ------------------	( )	( )	( )
Operate the business ---------------	( )	( )	( )
Do manufacturing processes ---------	( )	( )	( )
Manage a department ---------------	( )	( )	( )

SELECTED ACTIVITIES

Listed below are a number of selected activities which you might be involved in during a normal work day. Please check the amount of involvement you have in the activities listed.

	Always (daily)	Frequently (weekly)	Occasionally (monthly)	Never
Use test equipment to diagnose problems	( )	( )	( )	( )
Solve customer complaints	( )	( )	( )	( )
Sell merchandise	( )	( )	( )	( )
Act as a service writer	( )	( )	( )	( )
Prepare repair estimates	( )	( )	( )	( )
Maintain equipment	( )	( )	( )	( )
Do mechanical repairs on cars or trucks	( )	( )	( )	( )
Write a report	( )	( )	( )	( )
Work on an assembly line	( )	( )	( )	( )
Run your own business	( )	( )	( )	( )
Manage a business for someone	( )	( )	( )	( )
Work for a parts department	( )	( )	( )	( )
Do used or new car prep	( )	( )	( )	( )
Maintain equipment	( )	( )	( )	( )
Work as a jobber salesman	( )	( )	( )	( )
Work as a service manager	( )	( )	( )	( )

Others: (please specify)

1. ____________________	( )	( )	( )	( )
2. ____________________	( )	( )	( )	( )
3. ____________________	( )	( )	( )	( )